



FRIDAY, JULY 16, 1897.

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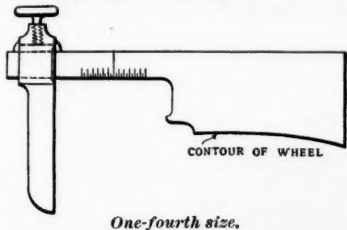
Contributions.

Car Wheel Flange Gage.

ALTOONA, Pa., July 6.

TO THE EDITOR OF THE RAILROAD GAZETTE:

At the February meeting of the New York Railroad Club, Mr. Tatnall (P. R. R.) read a paper on "The Method of Gaging in Mounting Wheels." On page 29 (in reference to mounting wheels), he says: "When the thickness of flange of wheels to be mounted has been ascertained, etc." I send



herewith a sketch of a handy gage to measure flange thickness that I have been using for quite a long time. The contour of wheel shown is that of a standard tire. It is graduated in 32ds. The center line of graduation is the standard flange, 1 1/2 in., and the line nearest measuring point on flange is limit to which a flange can be worn, or 1 in. The gage is made of steel plate 1/8 in. thick, gaging point to be case-hardened.

W. S. IRVINE.

The Thomas Pneumatic Interlocking.

Nashville, Chattanooga & St. Louis Railway, Nashville, Tenn., July 7, 1897.

TO THE EDITOR OF THE RAILROAD GAZETTE:

We now have in operation six pneumatic interlocking machines between the Union passenger station at Nashville and our shops, two miles distant, the apparatus being the same as that described in your issue of June 17, 1896, except that I have discarded the three-position valve shown at Fig. 20, and now use two two-position valves with which to handle three-position signals. Have also modified the pneumatic selector, so that one equalizing valve handles one or more signal blades.

In the six machines there are 176 working levers, handling, 35 switches, 19 cross-overs, 4 derails, 128 signals and 9 crossing gates.

At our shops we have two Ingersoll-Sergeant straight-line, piston-inlet compressors, steam cylinders 16 in., air cylinders 18 1/2 in., 18-in. stroke. One compressor is held in reserve. Air is compressed at 90 lbs., and in order to maintain a uniform pressure of 80 lbs. in the main, a Foster pressure reducing valve is introduced in the main just after it leaves the large reservoir. We tap the main at each tower with a 2-in. pipe, this pipe extending through the yard and supplying air to the machine and to the switches and signals. It is so arranged that when it becomes necessary to cut out a plant, it can be done by shutting one cock.

We have two miles of 3-in. mains, one mile of supplemental 2-in. main and 37 miles of 1/2-in. controlling and indication pipe for switches and signals.

All trains are handled by signals, each tower being a block station.

Below is a statement of trains handled over single track between Cedar and Clinton street yards, half mile, and over double track between Clinton street and shops, 1 1/4 miles, for May and June, 1897:

	May.	June.
Single track.	7,136	7,350
Double track.	6,639	7,350
Number of trains handled.	7,136	7,350
Average per day.....	230.2	245
..... week day.....	253.3	266.5
..... Saturday.....	281	292
Highest number any day..	281	292
Longest delay to any train, six minutes.		

J. W. THOMAS, JR.

The Boston Elevated Railroads.

NEW YORK, July 10, 1897.

TO THE EDITOR OF THE RAILROAD GAZETTE:

It is somewhat discouraging to learn, from your issue of 2d instant, that the old types of structure are to be so closely followed in the construction of the proposed elevated railroads in Boston. We are quite in the habit of criticising these older types, and yet, it would seem that they must have some vital merits, some special providence to protect them, or some powerful friends to aid in their perpetuation.

Every location presents some special features of advantage or of difficulty in railroad construction. It would seem that the lines in and about Boston are to be at first, at least, relatively short, and it is certain that the streets of Boston are narrow. If the lines are not to be long, the speed will not be so important, and if the stations must be frequent, the speed cannot be greater than about fifteen miles an hour on a single pair of tracks. If, however, the lines are liable to considerable extension, say, exceeding five miles in any direction, the speeds should be much greater than our present standards, and this can only be accomplished by placing the stations at distances apart greater than we are accustomed to on our rapid transit lines.

It is now easy to obtain a maximum speed of 35 miles an hour on elevated railroads, and it was shown in the experiments made in Chicago and reported in your columns, a year or more ago, that an average speed of 20 miles an hour, including stops, could be secured with engines of about 30 tons and with stations spaced about 3,000 ft. apart. This result is about what we have a right to expect from any new elevated railroad, under existing conditions of rolling stock and traffic. But 3,000 ft. is too great a distance between stations, for the denser sections of settlement; what then are we to do? "Put in two additional tracks for express service," says one: that way, however, lies financial danger and possible disaster. I shall not attempt to traverse the ground, ably covered in your columns, within the past few years, on the demerits of express service for rapid transit lines. It will, I think, be generally admitted that the three-track system for express service cannot be largely effective. If express trains are run at five minutes' interval, during the two rush hours, on such lines, only 24 trains would run, carrying about 10,000 passengers, or perhaps doing about 10 per cent. of the business of the Manhattan Railway. A three-track construction is about the best that can be done, when two tracks have already been laid with space between them for an extra track; its successful use, however, precludes the use of inter-track stations, with the recognized economy in station expenses incident thereto.

Elevated railroads should not be built unless there is a certainty of a large business, something approximating 10,000 passengers per day per mile, and if such a business seems probable, four tracks should be provided with long intervals between stations for each pair of tracks. If two tracks were added to each of the Manhattan avenue lines, and the alternate stations were used for each pair of tracks, the distance between stations on either pair would, generally, exceed 3,000 ft., and there would result a possible increase of average speed to about 20 miles per hour, or about the speed now attained by the third track express trains. This is probably the best result attainable for the Manhattan Railway, and would be a great gain over present results and correspond with an efficiency nearly three times as great as what we now have, or say, to a business of about 50,000 passengers per day per mile.

It would be well for our Boston friends to study their track arrangement carefully and arrange for the ultimate use of four tracks, with stations for each pair of tracks at long intervals; while for any particular line the stations would be frequent if the alternating system is used. The structure could be carried on two columns, as now proposed; it need not weigh much more than that shown in the cuts of your issue of July 2, and need not occupy more than 40 ft. in width of the streets, including cars, as against 33 ft. on the proposed three-track plan, the columns being placed the same for both systems.

RAPID TRANSIT.

Passenger Service and Rates in Great Britain.

LONDON, May 12, 1897.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The Great Western has just put into service some admirable new sleeping cars in which each passenger has a stateroom, with lavatory attached, so arranged that, to suit the convenience of two persons desiring to be together, each room can be connected with the adjoining stateroom by an interior communication altogether independent of the public corridor. The Midland has put on a very creditable new express each way between London and Manchester. But the sweeping improvements have been made by the North Western, which is indeed responsible for provoking the new Midland express. The North Western has, in the first place, considerably improved its service between both Manchester and Liverpool and London. It has reduced the time of the best Liverpool expresses (191 1/2 miles) to 4 1/4 hours (45 miles an hour), and now runs these trains without a stop between Crewe and London, 158 miles on the down journey from Euston and 152 1/2 on the up journey to Willesden. Further, the North Western has announced that it, too, will reduce its second-class fares to what has now become the universal level of about 1 1/4 d. per mile single and 2 1/4 d. per mile return.

Broadly our situation now is this: First-class fare 2d. per mile for the single journey, except in territories which the Midland Company controls or influences, where the standard is 1 1/2 d. First-class return fare from 3d. to 3 1/4 d. per double mile. For second-class the country is divided by a line drawn from the east up the river Thames as far as London, and thence straight across country northwest to the Scotch border at Carlisle. In the district north and east of this line, which includes the whole of Scotland, second-class has practically ceased to exist, except to some small extent in suburban service. South and west of the line second-class continues to flourish, with fares of, roughly, 1 1/4 d. and 2 1/4 d. per single and double mile, respectively. Third-class fares still remain: normally 1d. single and 2d. return, but it is fair to say that in certain districts, more especially in the south of Scotland and the northeast of England, the normal third-class return fare is more nearly 1 1/4 d.

The average rate per mile paid by the third-class passenger is, however, falling pretty rapidly, and a system has been recently introduced which seems likely to accelerate the descent. Over a large part of England it is now possible to obtain "week-end" return tickets available from Friday to Tuesday from all the important towns to pleasure resorts for little more than the single fare. These tickets, though nominally only available to pleasure resorts, can in practice be used without difficulty to intermediate points. Experienced railway men of my acquaintance consider that these week-end tickets have been lately extended somewhat recklessly, and that before long the wide extension of their use to stations for which they were not intended will compel a general reduction of fare.

In another direction a very important concession has been made to the third-class passenger, and once more it is by the London & North Western. The best trains between London and Holyhead have been confined to first and second class passengers only, and by these trains express fares, practically extinct elsewhere in England, were charged. And the best trains were bad—bad, that is, when tried by the standard set up by the North Western itself in its competitive services to Scotland. As for the third class services, it is not too much to say that they were a positive disgrace. By the best of them passengers left London at 9:30 in the morning and were passed by the Scotch third-class passengers leaving at 10 o'clock, when they had traveled a little over 100 miles. To reach Holyhead, 264 1/4 miles, the time allowed was seven hours. Under this state of things Irish public opinion has for the last few years been becoming more and more restive. Deputations from the Dublin and other Chambers of Commerce, constant attacks in newspapers and in Parliament, and to some extent pressure from the post office authorities, possibly also the competition of the Southampton against the Queens-town route for American mails and passengers, have at length done their work. And the North Western, though proverbially slow to move, never does a thing by halves when once its mind is made up. From May 1 the Irish service is improved out of all knowledge. Previous to that date there were four possible trains from London to Dublin. Two were express services, for first and second class passengers only, taking for the 264 1/4 miles rail to Holyhead, thence 64 miles steamer to Kingstown and 6 miles rail thence to Dublin, 10 hours 25 minutes and 10 hours 18 minutes, respectively. There were also two third-class trains, taking for the 264 1/4 miles rail to Holyhead and thence 70 miles sea to Dublin direct, respectively 12 and 11 1/2 hours. From May 1 all these trains carry third-class passengers and the times of the first three are respectively reduced to 9 hours 15 minutes, 9 hours 50 minutes and 11 hours, while the fourth is replaced by an entirely new train, which (only stopping once at Crewe, between London and Holyhead) also reaches Dublin in 9 hours and a quarter. This last-mentioned train runs the 106 1/4 miles between Crewe and Holyhead, the bulk of it over steep gradients along the wind-swept coast of North Wales, in 125 minutes—a quite first-class performance. Between Crewe and London the time is 3 hours 5 minutes, which is coming to be accepted as the North Western standard for this particular 158 miles.

The admission of third-class passengers to the Irish mails is interesting for another reason in that it removes the last exception on the great lines of the country to their now universal rule of third class by all trains. The boat expresses to and from the continent via Dover, Folkestone, New Haven and Queenborough still remain confined to first and second class passengers. The Brighton Company, moreover, the least progressive—possibly because the least competitive—of all our lines, still limits its few tolerable trains to first and second class or even to first-class passengers only. But apart from these few instances and this small area, the rule, third class by all trains, is universal in Great Britain. Ireland once more takes an independent course. The Great Southern, it is true, now admits third-class passengers to all trains but there is still a "first and second limited" carrying the mails each way between Dublin and Belfast, and, extraordinary as it may appear to those who know the poverty of the West of Ireland, a similar "limited mail" between Dublin and Galway.

W. M. ACWORTH.

The Movement of the Excursion over the Southern Pacific.

We gave some account of the Christian Endeavor excursion trains last week, page 488. General Manager

Kruttchnitt, of the Southern Pacific Company, has given the Associated Press the following details of how the traffic was handled over his road:

The movement was first felt on July 1, when the regular overland trains delivered by the Union Pacific and Rio Grande Western at Ogden were run in several sections. They carried the advance guard of the movement, the main army of which reached the Central Pacific lines (Ogden) on the evening of July 4, pouring through in an almost uninterrupted stream until the evening of July 8. Including regular trains, there were moved out of Ogden from the 1st to the 8th 74 trains, of which 50 were specials or sections of the regular trains; the total number of cars moved was 838, or an average of nearly 12 cars per train; the total number of passengers was 23,800, or 310 per train.

The distance from Ogden to San Francisco is 833 miles. Over the first part of the railroad the trains had to be lifted a total height of 9,339 ft., nearly two miles, and within a distance of 11 miles they had to be dropped down a mountain grade with a vertical fall of 7,000 ft., equal to nearly a mile and a half.

The question of obtaining sufficient water for the locomotives gave more concern than any other matter. Almost the entire distance across Utah and Nevada the country is practically a desert. Many of the water stations are supplied by gravity lines from springs in the mountains; extra watchmen were detailed to go to the heads of these lines to prevent leaves, chips or obstructions of any character from getting into the pipes. At all stations where the water was procured from streams, springs or wells, extra pumps were put on so as to keep the pumps going night and day. At some stations where the supply obtained from springs and wells was short, water was delivered by means of tank cars.

The most serious problem after that of watering the locomotives was that of feeding the people, but the railroad officials arranged with citizens of Terrace, Elko, Carlin, Humboldt, Battle Mountain, Walsworth, Truckee, Summit, Blue Canyon and Auburn to furnish luncheons outside of the regular eating-houses. The company's forces were detailed to erect long counters or tables in the open air, at which the meals could be dispensed.

Up to June 27 it was thought that the regular locomotives on the Central Pacific would be able to handle all the trains offered, but as reports were received from the East of the magnitude of the movement it was determined to prepare for a traffic larger than the company was warranted in expecting from any of the reports received. Locomotives were borrowed and the arrangements were so perfectly made that there would have been no difficulty in handling 50 per cent. more trains than the company received.

It was at first intended to keep the trains 30 minutes in time apart, but finally the time-limit was abandoned and the space limit substituted. An order was issued blocking the Central Pacific road absolutely at 12:01 a. m. of July 4, and forbidding any operator clearing his semaphore signals to allow a train to pass his office until he had received word from the next telegraph station west of him that the last train in advance had passed him and left the track clear. The entire traffic was handled without the slightest accident.

From Los Angeles and Mojave the Southern Pacific carried about 4,000 passengers, and from Portland about 2,000.

M. C. B. Association Standards.

At the convention held at Old Point Comfort certain motions prevailed to refer recommendations for standards and for recommended practice to letter ballot on the following subjects:

For Adoption as Standards.

- A.—Pocket Strap for Automatic Couplers.
- B.—Buffer Block Details with Location of Buffer Blocks.

For Adoption as Recommended Practice.

- C.—Uncoupling Arrangements for M. C. B. Automatic Couplers.
- D.—Mounting Wheels.
- E.—Box Car Side and End Doors.
- F.—Arch Bars and Column Bolts for Diamond Trucks.
- G.—General Dimensions for Steel Underframing.
- H.—Loading Logs, Poles, Bark and Long Structural Materials on Cars.

The committee which reported on automatic couplers recommended that the design for pocket strap included in the recommended practice of the association, and shown on sheet B, proceedings for 1896, with a radius of $\frac{1}{4}$ inch at inside back corners, be made a standard of the association. The matter was ordered submitted to letter ballot as recommended by the committee.

A motion prevailed to submit the details of the buffer block as shown on sheet M. C. B.—B of the recommended practice, with the necessary measurements to locate these buffer blocks as there shown, to letter ballot for adoption as a standard of the association instead of recommended practice. The ballot is to determine whether these details and this location shall be adopted as Standard instead of Recommended Practice as heretofore.

The committee which reported on uncoupling arrangements submitted three diagrams with some details, showing what parts of the uncoupling arrangements might be uniform with different types of couplers. The

details show the lever, clevis, clevis pin, link and brackets for supporting the rod; the parts enumerated to be made of malleable iron. In explanation of these diagrams the committee reported as follows:

Diagram No. 1 shows the application of the proposed standard parts to a car with concealed end sills with the parts of the dimensions and located as shown on "Plate B, Recommended Practice for Attaching Automatic Couplers to Cars,"

arranged to operate the lock in a coupler having the lock located on the vertical center line of the coupler.

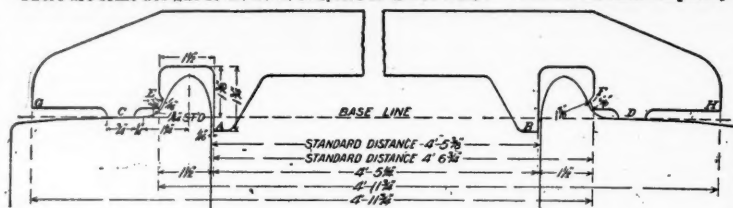
Diagram No. 2 shows the application to the same design of car with the center of the lock located 3 in. from the vertical center line of the coupler. Within these limits are located the locks on the great majority of couplers in service.

Diagram No. 3 shows the application to a car having projecting end sills. The bracket supporting the end of the release rod farthest from the coupler is provided with a projection to enable the lock of the coupler to be held in the raised position by pushing the rod toward the center of the car, after being raised, until the outer arm engages the projection, a feature which with many designs of couplers is necessary.

It also adds that:

The dimensions of the parts as shown will be suitable for all cars with dead blocks of the dimensions as shown on "Plate B, Recommended Practice," and with end sills 8 or 9 in. in depth; for cars with these parts of different depths the proper adjustment can be made by changing the relation of the arms of the lever to bring the center of the eye of the horizontal arm to the proper height above the eye of the lock or by the use of links of different lengths.

There are some designs of M. C. B. couplers in use in which



Proposed Wheel Check Gage—M. C. B. Report.

the lock is operated from the side or from beneath. As each type has a distinctive method of operating the lock, your committee did not think it necessary to consider them in this report, although some such types are used in considerable quantities.

After a discussion of this report, it was amended by adding that where lifting rods are at the side, they shall be 1 in. in diameter, and as thus amended the recommendations as shown were ordered submitted to letter ballot as Recommended Practice.

The standing committee on Mounting Wheels reported recommending the second paragraph of Recommended Practice for Mounting Wheels, shown on page 501 of the proceedings for 1896, be omitted and the following inserted:

First.—That wheels with flanges worn to a thickness of 1 1/2 in. or less shall not be remounted.

Second.—That the thickness of flanges of wheels fitted on the same axle should be equal and should never vary more than 1/8 in.

Third.—That in mounting wheels, new or second-hand, the standard wheel check gage should be used in the following manner:

After one wheel is pressed into position, place the stop A or B of the check gage against the inside of the flange of the wheel with the thinner flange with the corresponding tread stop C or D against the tread of the wheel. Press the other wheel on the axle until the opposite tread stop comes in contact with the tread with the corresponding gage point E or F in contact with the outside of the thicker flange.

The question is as to the adoption of this change above recommended in the Recommended Practice for Mounting Wheels.

The committee which reported on box car side and end doors showed designs for box car side door and end door fixtures. After the omission of some dimensions of height and width of door, the fixtures were ordered

Second.—The inside width should be 8 ft. 4 in. for a standard box car of 60,000 lbs. capacity.

Third.—The height from the top of the floor to the top of the plate should be 7 ft. 6 in. for a standard box car of 60,000 lbs. capacity.

Fourth.—The width of the side door should be 5 ft. 4 in. clear for all box cars.

Fifth.—The end doors, if any are used, should be 24 in. wide by 36 in. high.

Sixth.—The height from the top of the rail to the top of the floor should be 4 ft. 2 in.

Seventh.—The design should show the end sill flush, and not projecting beyond the siding.

The committee also recommends that the dimensions above given for standard interchange box cars, as far as length of sills, width and height from the rail are concerned, should be adopted, also for other flat bottom freight cars of 60,000 lbs. capacity, such as stock, gondola and flat cars, so that same style of sills, bolsters, end sills and draft gear will suit for all these classes of cars of the same capacity.

The committee further adds that it is believed that the adoption of a standard cubic capacity per ton of 2,000 lbs. for interchange box cars is desirable, and it recommends that the figure of 70 cu. ft. per ton of 2,000 lbs. be adopted for freight box cars, as this figure conforms with the dimensions for a box car as recommended in this report. The recommendations of this committee

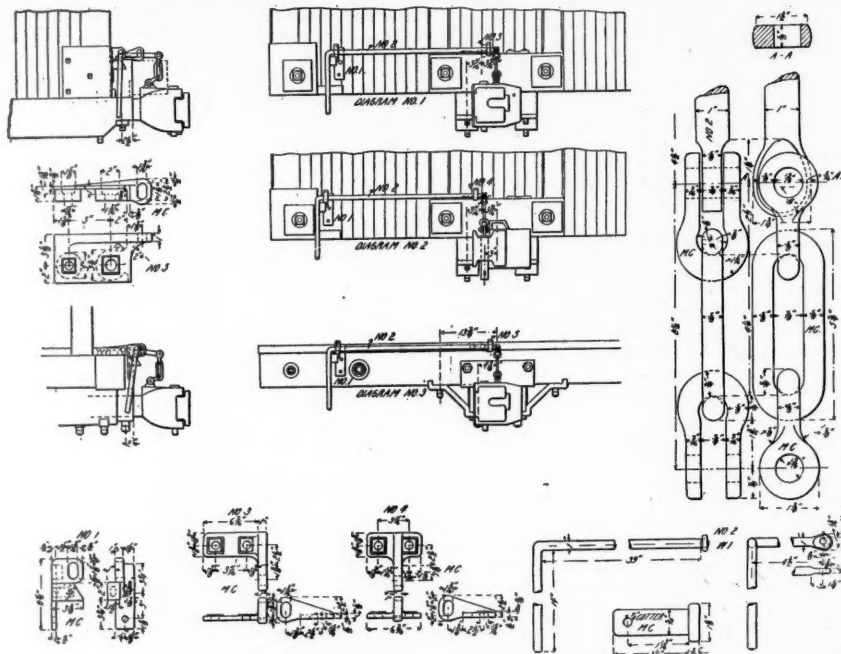
were ordered submitted to letter ballot for adoption as Recommended Practice.

The committee which reported on the revision of the rules for loading logs, poles, bark and long structural materials on cars submitted a report. The matter was ordered submitted to letter ballot for adoption as Recommended Practice.

The votes will be counted on Aug. 2, 1897, and any votes not received at the Secretary's office before that date will be excluded from the count, as provided by the Constitution.

Water Supply for Locomotives.*

Quality of Water.—Absolutely pure water, which is best for boiler purposes, is not found in nature. Some springs furnish water that is nearly pure, but as a rule lake and river water is much better for boilers than that from wells or springs. In the Western prairie states well-water is invariably charged with incrusting or alkaline salts. Artesian wells generally yield a very poor quality of boiler water. River water frequently contains suspended matter such as mud or silt which can be removed by simple mechanical means. When using water which contains mud it is advantageous to construct a settling basin that will hold not less than a week's supply and put all the water into the basin and allow it to settle before pumping it into the tank. It is much easier and costs less to occasionally remove the mud from the settling basin than from the locomotive boilers.



Proposed Uncoupling Arrangements—M. C. B. Report.

submitted to letter ballots as Recommended Practice of the Association.

The committee which reported on arch bars and column bolts for diamond trucks submitted plans for arch bars and column bolts for cars of 80,000 lbs. capacity. These were ordered submitted to letter ballot for adoption as Recommended Practice of the Association for cars of this capacity.

The members who were appointed to submit individual designs for steel underframing made a joint report on certain general features, and agreed that the following measurements should prevail in their several designs for box cars with steel underframing:

First.—That the inside length should be 34 ft. for a standard box car of 60,000 lbs. capacity,

Where water contains impurities which form incrustations, it has been found profitable to analyze the water from each station and ascertain the proper kind and amount of chemical to be added to each particular water in order to neutralize the salts contained, and then use the substance regularly as directed by the chemist.

Location of Tanks.—If good water can be obtained in sufficient quantities wherever needed the requirements of the service govern the location. For instance, on a road with light grades freight trains can run 40 miles without taking water while on heavy mountain grades, eight miles may be all that can be made with one tank

*From a paper read before the Western Railway Club, May 18, 1897, by Mr. Thomas Appleton.

of water. On light-grade roads water tanks should be located at intervals of from 12 to 18 miles.

On many railroad divisions, however, it is impossible to get suitable water at the theoretically proper location, and tanks have to be located between stations. Where there is no particular local business it is a good plan to locate the station at the water tank, but this idea should not be carried too far. Trains can be dispatched most conveniently if the passing tracks are at equal distances apart, and with a light traffic it is not such a serious matter to have the tanks between stations. When a tank has to be placed between stations its location should be carefully selected with reference to grades and alignment. It should be located so that trains stopping to take water can be started again easily, whichever direction they may be going, and the train should be visible at a long distance when stopped for water. Avoid placing a tank on the inside of a curve, or where a succession of curves and bluffs cut off the view of the tank from the track. The tanks should be placed on the north side of the track, so that the sun will shine on the spout, and thus hinder the accumulation of ice in winter. The exact distance of the side of the tank, horizontally and vertically, from the rail varies on different roads, but the tendency is to raise the tanks higher while keeping the spouts at the proper height to discharge into the tender, because the water flows faster from the higher tank.

Methods of Supplying Tanks.—In a mountainous region there are usually plenty of springs of good water at such an elevation that it will flow by gravity into the tank. This is the cheapest and best method of filling a tank. When a long line of pipe is laid, the pipe should be large enough so that the friction does not use up the force of gravity. Next in point of cheapness of operation come the hydraulic ram and the windmill. The locations where a ram can be used are limited in number. When properly put in and piped it is a very efficient machine, but those who think a hydraulic ram will run itself forever without attention make a mistake. The windmill occupies a much larger field. A good windmill when once properly installed and equipped will do all the pumping for an ordinary water station

larger pipes. If the economy of operation is considered, the longer the pipe the larger should be its diameter.

It is always advisable to get the pump as near the water as circumstances will allow, that is, make the suction lift short, both horizontally and vertically. If there is a small leak in the suction pipe it may destroy the suction power of the pump entirely, and the shorter the pipe the less the number of joints to leak. A leak in the discharge pipe does not prevent pumping water as a leak in the suction pipe would do.

It is better and safer to have all water tanks at stations, even if long pipes are required to convey the water from the source of supply to the tank. It is better to put in a discharge pipe a mile long rather than have trains stop a mile out from a station to take water. The first cost of the pipe is considerable, but if properly proportioned it does not cost much to move water through it.

There are other methods of getting water into locomotive tenders, which do not require elevated tanks, such as submerged tanks with direct connection to the steam dome of the locomotive, by means of which the water in the tank is forced up into the tender.

In conclusion, my advice condensed would be:

Get good water if it is a possible thing.

Get plenty of it. If the water is roily settle it; if it is scale producing physic it. Consult the chemist.

Get good machinery, each plant being designed for its special conditions, set it up and pipe it properly, and take care of it.

Give the windmill a fair chance.

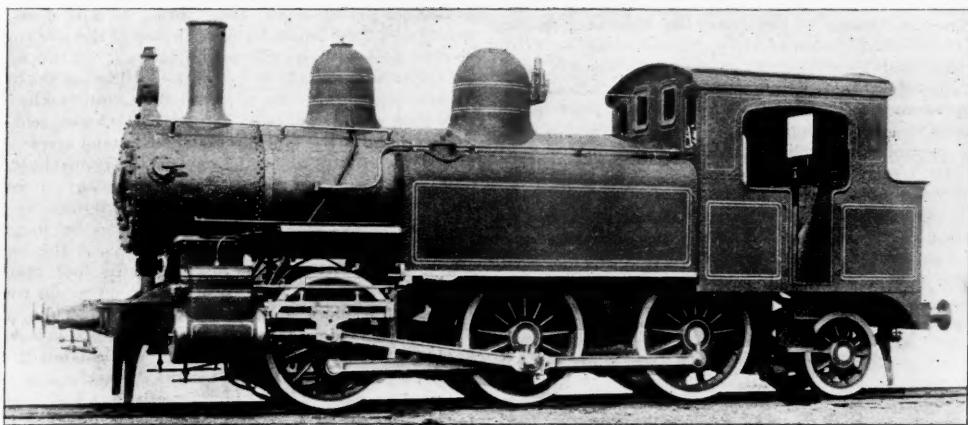
Clean out the tanks whenever there is any mud in them.

When considering the proper size of a discharge pipe, don't be parsimonious.

Cooke Tank Locomotives for Japan.

The engraving shows one of the two tank locomotives recently sent to the Boso Railroad of Japan by the Cooke Locomotive and Machine Co. The general specifications of the engines are as follows:

Gage..... 3 ft. 6 in.



Cooke Tank Locomotive for Japan.

without expense or attention except an occasional oiling. There are locations where a windmill is not the best power to use, and some are prone to condemn windmills generally because a mill badly located or with a pump improperly piped has failed to do all that was expected of it.

Probably more tanks are supplied by steam pumps than by any other method. Usually a standard size and make of pump is adopted for the water service on a railroad, and the same pump is used whether the lift is 50 or 150 ft., and without regard to the quantity required per day. Economy of fuel would require that a pump should be selected especially for the duty at a given point, and pumps of different proportions used at different places. But fuel does not cut a large figure in operating the water stations on a railroad—the cost of attendance is the main item. The steam boiler requires constant watching, and a man has to be employed for a little four-horse boiler when he could take care of a 40-horse boiler just as well. Generally one pump runs two or more steam pumps, but even then the principal item of cost is the attendance.

Of late, gasoline engines have been tried to some extent for supplying water tanks, and with very satisfactory results. A good gasoline engine will run all day without attention. A skilled engineer is not required; the station agent or section foreman can run the plant and have plenty of time for his ordinary duties. The gasoline engine is economical of fuel, for its fuel consumption stops as soon as its work stops.

I believe that the day of steam pumps for isolated water stations is past, and that the gasoline engine will supplant them. At division terminals or shops, where steam is required for other purposes and the steam pump for supplying the tank can be located in the boiler-room, the direct acting steam pump is the proper thing to use, but the gasoline engine or windmill will do the work cheaper out in the country.

The friction of water in the pipes is often not sufficiently considered and the tendency is to lay small pipes for long distances because of the greater first cost of

pleted, leaving 18,786 ft. unfinished. The total cost of this tunnel will be \$1,010,000.

Ground has been bought for two new pumping stations and three pumping engines for each station have been contracted for, the capacity for each engine being 20,000,000 gallons of water every 24 hours. These two buildings will cost together about \$300,000 and the machinery for each will cost about \$470,000.

New pavements were laid on 81.74 miles of streets and 4.33 miles of alleys. There were built 238.25 miles of sidewalks. The water pipes laid amounted to 432,602 ft.

The sewerage system was extended by the construction of 57,419 miles of sewers at a cost of \$721,870. The cost of maintaining sewers was \$143,183, making an average cost per mile for maintenance of \$109.64.

During the year 6,444 buildings were erected representing an aggregate frontage of 158,846 ft. at a cost of \$22,730,625.

The city is now operating four electric light plants, which supply current for 1,254 arc lamps. The larger part of the lighting, however, is done by private corporations.

The receipts from street railroads, including both surface and elevated roads, from April 1, 1895, to Dec. 3, 1896, were \$461,674, of which amount \$317,069 was for 1896 alone.

In the matter of track elevation ordinances have been passed and approved for elevating the greater portion of the Milwaukee and Wisconsin divisions of the Chicago & Northwestern, and the tracks in Rockwell street owned by the Northwestern, the Pittsburgh, Cincinnati, Chicago & St. Louis, and the Chicago & Northern Pacific. Provision has also been made for elevating a large portion of the Pittsburgh, Fort Wayne & Chicago, and for extending the elevation of the Lake Shore & Michigan Southern beyond the point prescribed in the original ordinances relating to that line. The track elevation work already accomplished or provided, for under ordinances now in force covers 41.7 miles of tracks and 165 subways.

The Diversey Avenue bridge was completed within the year 1896 and opened to traffic Jan. 11. The total cost was \$31,345. The Wells Street bridge was altered to a double-deck structure to be used by the Northwestern Elevated Railroad. The expense was borne by the Lake Street Elevated.

The South Halstead Street Viaduct, which spans the tracks of the Union Stock Yard & Transit Co., was opened Sept. 5, 1896. The cost was \$83,594, and was borne by the railroad company. A rolling bascule bridge was completed where North Halstead Street crosses the north Branch of the Chicago River. This bridge is operated by electric motors and cost \$114,000.

The total cost of maintaining all bridges and viaducts for the year 1896 was \$127,925.

The dredging done in the Chicago and Calumet rivers consisted in the removal of 51,340 cu. yds. by the city at a cost of \$10,333 and 225,400 cu. yds. by dock owners at a cost of \$45,080. The United States government did dredging to the amount of 428,402 cu. yds., at a cost of \$44,442.

The total trade by the lake at Chicago during the year, including entrances and clearances, was 16,997 vessels, carrying 12,965,812 tons.

An appendix is added to the report which gives in alphabetical order abstracts of the franchises granted by the City Council to the various surface and elevated street railroads, together with a map of each road. The appendix forms a complete record of all lines built, extended or granted additional privileges between March 4, 1837, and April 1, 1897.

Railroad Legislation in Connecticut.

The Legislature of Connecticut has passed during the present year 16 acts affecting railroad interests.

Chapter 37 authorizes railroads, both standard and street, to regulate by reasonable by-laws the kinds and sizes of packages to be allowed in passenger cars.

Chapter 70 amends the highway crossing law (section 3,482) authorizing the Railroad Commissioners to determine the length, width and material of overhead bridges and to order a bridge to extend beyond the railroad; no such bridge shall hereafter be built until the Commissioners have determined its length, width, material, plan and height above the roadbed.

Chapter 88 defines the powers of the purchasers of a railroad under foreclosure. The amount of capital stock shall not exceed the total value of the railroad and franchises, which value shall be determined by the State Railroad Commissioners.

Chapter 105 empowers street railroad companies to purchase land, by agreement with the owner, to avoid heavy or inconvenient grades or to facilitate the operation of the road; provided that the course of the road is not substantially changed.

Chapter 153 amends the law concerning special taxes on corporations. Where stock is liable to taxation the corporation must return a list of non-resident stockholders and pay, on their behalf, a tax of 1½ per cent. annually.

Chapter 156 changes the date on which street railroads shall make their annual report to the Railroad Commissioners; the reports are to be to June 30 instead of to Sept. 30.

Chapter 160 amends section 3,542 of the general statutes forbidding railroads to increase commutation passenger fares. Such fares must not be increased so as to alter the

Total weight in working order.....	78,000 lbs.
" " on drivers.....	61,000 lbs.
" " on trailing wheels.....	16,000 lbs.
" wheel base of engine.....	19 ft. 3 in.
Driving wheel base.....	13 ft. 3 in.
Cylinders.....	15 in. x 20 in.
Driving wheels, diameter.....	4 ft. 6 in.
Engine trailing wheels.....	3 ft. 1 in.
Driving axle journal.....	7 in. x 7¼ in.
Trailing.....	6 in. x 7¼ in.
Boiler type.....	straight top
" working pressure.....	160 lbs.
" diameter first course.....	50 in.
" firebox length.....	5 ft. 8 in.
" " width.....	2 ft. 5 in.
" style of grate.....	Rocking
" tubes, number.....	151
" diameter and length.....	2 in. O. D., 9 ft. 11 in. long
" thickness of shell.....	¾ in.
" heating surface tubes.....	783 sq. ft.
" " firebox.....	75 sq. ft.
" " total.....	858 sq. ft.
" grate surface.....	13.7 sq. ft.
Slide valve.....	Richardson's balanced
" travel.....	5¼ in.
Steam ports.....	14 in. x 1¼ in.
Exhaust.....	14 in. x 2¼ in.
Lap.....	¾ in.
Exhaust pipe.....	at base, 4¼ in. x nozzles 3¼ in., 3¼ in., 3¼ in.
Smoke box.....	50 in. diameter inside, 4 ft. 5 in. long
" netting.....	2¼ mesh, No. 12 W. G.
Center of boiler from rail.....	6 ft. 11¼ in.
Top of stack.....	12 ft. 4 in.

The Department of Public Works, Chicago.

The twenty-first annual report of the Department of Public Works to the City Council of Chicago for the year ending Dec. 31, 1896, has recently been issued. The cash shortage or floating debt on Jan. 1, 1897, was \$4,525,567, which is a decrease during the last two years of nearly \$623,000; during the same time a reduction was made in the pay-rolls of over \$1,800,000, and the bonded debt was reduced \$644,000.

Of the 50,796 ft. of new land tunnels to be used in connection with the city water-works system, commenced in the latter part of 1895, 24,300 ft. have been completed up to April 1, 1897. The total cost of the work will be \$1,150,000. Of the new lake tunnel, which is the lake extension of the land tunnels, 2,334 ft. have been com-

Described in the Railroad Gazette, April 30, 1897.

ratio between them and the regular way fares as it existed on July 1, 1865.

Chapter 165 authorizes the sale of unclaimed freight by express companies and other common carriers. Perishable freight may be sold at once; other articles after being held six months. The proceeds of articles

other token entitling him to transportation to and from Hartford during any session of the Legislature.

Chapter 184 forbids blacklisting, under penalty of \$200. Chapter 189 limits to one year the time within which suits for damages for personal injury may be entered against a city or a railroad; no suit for loss of life may be begun except within one year after the death of the person.

Chapter 197 requires that notice of claims against railroad and street railroad companies for damage to person or property must be given within four months after the neglect complained of.

Chapter 207 declares discontinued all public highway crossings which have been abandoned for 15 years. Wherever a private crossing has been discontinued by a railroad company without the consent of the owners, the company shall restore the same within 30 days upon written request.

Chapter 209 requires street railroad companies in their reports to apportion cost of road, equipment and permanent improvements, as ordered by the Railroad Commissioners.

Chapter 241 empowers the Railroad Commissioners to order the platforms of street cars to be enclosed with gates or vestibules, or both, whenever they deem necessary, first giving the company reasonable notice; penalty, \$25 a day.

Chapter 243 is the steel railway law, taking the place of section 8 of chapter of 169 of 1893. No street railroad shall be built or extended from one town to another in the public highways so as to parallel any other street railroad, or any railroad, unless authorized by special charter prior to Jan. 1, 1893, or unless the Superior Court declares that public convenience and necessity require the road. Nor shall street railroads, acting under charters hereafter granted, parallel any other street railroad, or any railroad, except within the limits of a city, without the approval of the Superior Court. The Court shall give suitable notice of hearing, and its decision shall be final; it may authorize the construction of a part of a desired railroad.

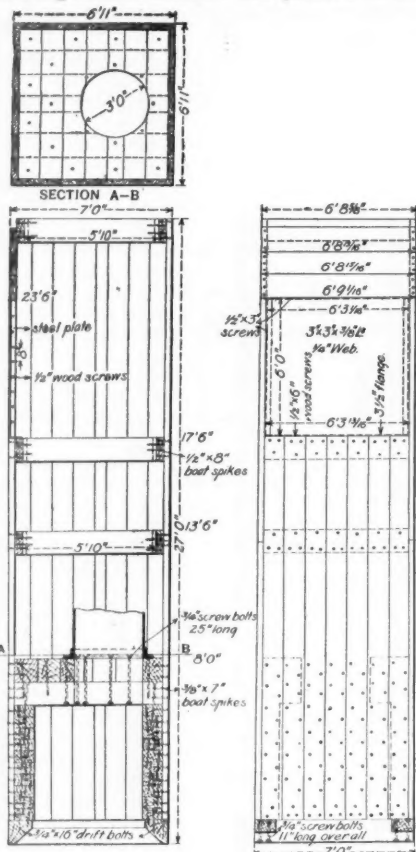


Fig. 2.—Yellow Pine Caissons Used to Sink Foundations for Mercantile Building.

sold must be held five years subject to the call of the owner.

Chapter 182 requires the Comptroller of the State, when requested, to procure coupon tickets for members of the Legislature for transportation between the member's home and the state capital during the session, the member to assign to the state his mileage allowance. The Comptroller is to pay the lowest rate for which the

Foundations for the Mercantile Building, New York.

The foundations for the Mercantile Building, now in course of construction at the southwest corner of Fifth avenue and Twenty-second street, have recently been completed. This structure will be a 12-story office building fronting 29 ft. on Fifth avenue and 110 ft. on Twenty-second street. The foundations, as shown in plan, Fig. 1, consist of 14 isolated piers, each resting on bedrock, which is reached at depths varying from 30 to 38 ft. below the curb. The foundations were all sunk by the pneumatic method, the square ones being put down by caissons built of yellow pine, the others by cylindrical steel caissons.

The construction of the wooden caissons is shown in

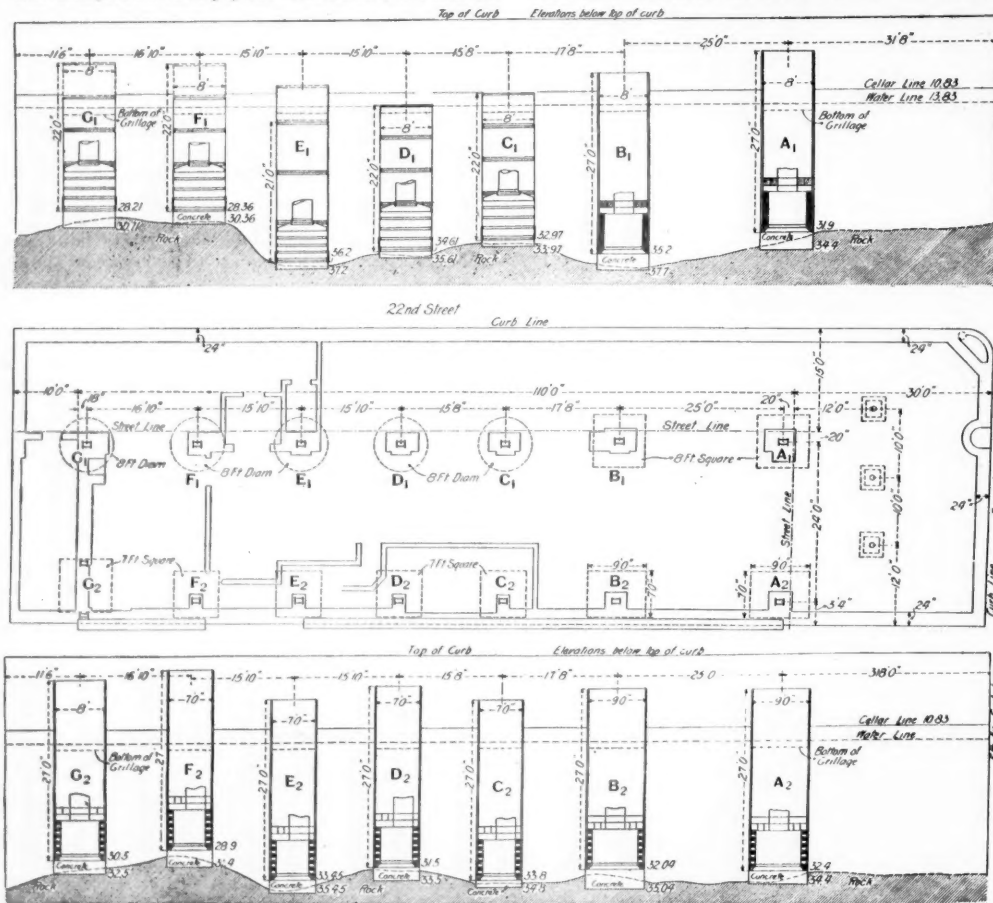


Fig. 1.—Plan and Sections of Foundations for Mercantile Building.

tickets can be obtained of the railroad company, and coupons not used at the expiration of the session shall be returned to the Comptroller and by him to the railroad company, which company shall refund the price of the coupons not used. Except as provided in this law, no railroad shall issue to any member any ticket or

Fig. 2. Four of these measure 7 x 7 ft. in plane; three, 8 x 8 ft., and two are 7 x 9 ft. The side walls of the working chamber are built of 6 x 10 in. timbers, the cutting edge being made of 12 x 12 in. timbers beveled as shown. The roof of the chamber is of two thicknesses of 12-in. timbers, laid at right angles. The outside of

the caisson is sheathed with 3 x 13 in. tongue and grooved planking, which extends from the timbers forming the cutting edge to the top, making a cofferdam. The only bracing in the coffer-dams are three belts of 6 x 10 in. timbers fastened inside as shown in Fig. 2. In one side of each of those which are sunk close beside

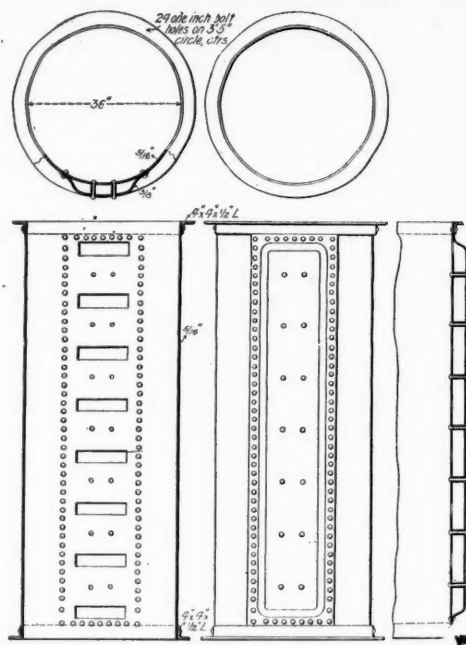


Fig. 4.—Pneumatic Caisson Shafting of Messrs Stephen & O'Rourke.

the wall of the adjoining building there is a 1/4-in. steel plate the full width of the caisson and 6 ft. high. The plate is in the side of the caisson which comes next to the wall, and is placed where it will come opposite the grillage at the top of the foundation. This is done in order to let the I-beams forming the top of the pier come as close as possible to the adjoining wall. In this way, the cellar columns which rest on the grillages at the tops of these foundations can be placed 2 1/4 in. closer to the old wall than would otherwise be possible. Consequently, the overhang of the cantilevers, which extend across the tops of the columns, and which carry at their ends the steel posts of the building skeleton, is reduced a like amount. The plate is fastened in the side of the cofferdam by 1/2 in. wood screws which go through holes in flanges turned at the edges of the plate. The sides of the caissons are built with a batter of 1/8 in. to the foot, except in the case of those which are sunk beside the old wall. In these, the side coming next to the wall and the one opposite are made parallel; the other two sides, however having a batter. This is shown in the caisson illustrated, where it will be seen that the dimensions at the top are 7 ft. and 6 ft. 8 1/2 in. respectively. The reason for making the two sides parallel was to prevent any disturbance under the adjoining foundations that might be caused by sand settling and filling the space left by the sloping sides. Precautions were taken against any disturbance under the foundations by supporting the building on shores, but little or none took place.

The five steel caissons used are of the form shown in Fig. 3. They are circular in plan, and 8 ft. in diameter. The sides of the working chamber are made of 3/8-in. steel plates, while 1/4-in. plates were used above the deck. The cutting edge is strengthened with a 3/8-in. plate extending 2 ft. above the bottom, and a 4 x 6 x 1/2-in. angle close to cutting edge, so that at this point the shell is 1 1/2 in. in thickness of steel to resist collapse from pressure or rupture from blasting. The deck is made of a 1/2-in. bumped plate, as shown, in order to carry the weight above without the use of any roof bracing in the chamber. The roof is riveted to the sides of the chamber and is strengthened around the edge of the hole cut for the shaft by an annular plate 1/2 in. thick and 4 in. wide. The side walls of the working chamber above cutting edge are braced by three 4 x 4 x 1/2-in. angles, bent circular, and riveted to the walls, as shown. This form of construction does away with the customary I-beam and knee bracing in the working chamber, and is stronger, lighter and more scientific, besides allowing more room for the workmen. Above the deck the only bracing consists of pairs of 3 x 3 x 1/4 in. angles bent circular and placed where the sections of the cofferdam join. The two top sections of the cofferdam were bolted together and to the lower sections so as to be easily removed.

Each caisson, whether of wood or steel, was fitted with but one shaft of the type shown in Fig. 4. This shaft was designed by Messrs. Stephens & O'Rourke, the contractors for the foundations, and is used both for men and material. As will be seen, there are rectangular holes cut through the 1/2 plate forming a section of the shaft. These holes, which are 3 x 12 in., form steps for the men. Riveted on the outside of the shaft, over the holes, is a 3/8-in. pressed steel cover plate. This stands out 4 in. beyond the shell of the shaft, allowing sufficient room for a footing on the steps. The cover plate is also fastened to the 1/2 shell of the shaft by staybolts, two of which are placed between the foot holes. Around each end of the sections, which are 8 ft. long, there is rivet d

a 3x4x½-in. angle, drilled to receive the bolts used to fasten the sections together.

Two kinds of air locks were used on the work. One was that made by the Cockburn, Barrow & Machine Co., and the other, one recently designed by Messrs. Stephens & O'Rourke, and built by Messrs. James R. Floyd & Sons. The latter, like the shaft, is for the use of men and material. It is very compact, being only 7½ ft. high and 5 ft. in diameter, and hence well adapted for use in a small space. The valves in the lock are balanced and are worked from the outside by hand levers. The lock can be easily operated by two men. It can be worked with great rapidity, a bucket being locked in and out in 6 seconds. The new lock and shaft have been adopted by the contractor for the New York tower foundations for the new East River Bridge to be used on that work.

The earth through which the caissons were sunk consisted of about 2 ft. of clay underlaid with a fine wet sand, which extended down to hardpan. The work of sinking the caissons was carried on with unrivaled dispatch. It began with caisson A_1 at 1 p. m., May 22, and ended with caisson E_2 at 10 p. m., June 18. Caisson A_1 was placed in 164 hours of actual working time, B_1 in 64 hours, C_1 in 41½ hours, D_1 in 78 hours, F_1 in 54

top of the bed of concrete. The posts are about 14 in. square and 4 ft. 6 in. long, and have a pair of wedge blocks also at their tops.

As the actual time of sinking and finishing caissons was less than four weeks, this work proves that when properly managed and with the best obtainable machinery that a pneumatic caisson foundation need take no longer than the most ordinary kind of foundation to build, and it further proves that the question of time of completion of buildings of this description has now been shifted from the shoulders of the foundation contractor to those of the steel frame contractor, for although these foundations have been ready a month no steel has yet been placed. As the contract time for the foundations was only two-thirds used up by Stephens & O'Rourke on this work, they are to be congratulated on the unique distinction of finishing a foundation ahead of time, and having it ready four weeks before the contractor for the iron work was ready to begin.

The architect of the building is Mr. Robert Maynicke, of 727 Broadway, a well-known designer of office structures, and the owner is Mr. Henry Corn.

Hot Boxes—Their Causes.*

The prevention of hot boxes and the consequent loss of time and waste of material occasioned by them has always been, as it is to-day, a serious problem with the operating and mechanical departments of the railroads. That the officials of these departments realize the importance of the problem, is shown by the labor they are expending in attempting a solution.

Unfortunately, however, much of this labor has been done in railway laboratories and shops where the conditions could not be made the same as those encountered by trainmen in actual experience, and the results obtained are, therefore, not the same as those gathered in every-day operation on the road. The oil that gives good results when fresh and new, as tried in oil-testing machines in a railroad laboratory, will give different results when thickened by wear and evaporation, and the waste that was springy and gave off freely to the journal its oil when new and fresh, loses its virtue when it becomes solidified with dust and the gummy residue of the evaporated oil as it is often found in journal boxes on the road.

Nearly every mechanical superintendent has his own pet formula for the material of which the brass and babbitt should be composed, and there is to-day no uniformity of opinion among superintendents of motive power and master car builders as to which is the best. All the brasses in use, if made of a copper alloy that is thoroughly homogeneous, gives good results if properly fitted to the bearing face of the axle. Our experience has been that the fitting of the faces in contact so that there will be uniform pressure is as important as the alloy of which the brass is composed, or the kind of babbitt used on the face of the brass to make it find a perfect bearing.

All modern, properly made car trucks and journals when first set up and put into service are so constructed that they have a perfect bearing and equalizer, and will remain in this condition and run cool until the parts are thrown out of position by the shock and other disturbing conditions which they are subjected to in use; and just here is the problem to be considered.

The causes of hot boxes are as follows:

First.—The most common we would mention is waste grabs, caused by a small string of waste getting between the axle and brass when the side of the brass is temporarily raised by the application of the brake, or other disturbing causes. This is the result of improper packing.

Second.—The lack of lubrication on the back end of the bearing face of the journal, occasioned by the waste being twisted into a rope and drawn from that portion of the bearing and pushed to the front end of the box by the lateral motion or end thrust of the axle while running. This condition is also caused by the imperfect packing, permitting the waste to be connected the whole length of the box.

Third.—The use of poor waste and lubricating oil.

Fourth.—Fine sand between the rubbing faces at the back end of the bearing. This sand is thrown from the concave part of the wheel, where it has been gathered and retained by centrifugal force, and thrown through the opening in the back end and top of the box around the edges of defective dust guards as the train slackens. This fine sand dries up the oil and permits metal contact, which generates heat.

Fifth.—Old gummy waste, resulting from the evaporation of the oil when cars have stood for a long time out of service. The oil has become so thick that there is no capillary action to carry it to the face of the journal.

Sixth.—The brass being thrown out of position while the axle is temporarily relieved of its load by the swaying of the car or the shock and jarring the journal is subjected to while in transit. In such a case hot boxes will occur when the journal is running in a perfect bath of oil. This is occasioned by a reduced arc of contact, the faces, where they touch, being pressed so tightly together that the oil is forced from between them.

Seventh.—Overloading, which presses the brass so closely to the axle that oil will not feed between the bearing faces. This condition occurs when the meeting faces are in a natural position. The excessive load is beyond the limit of pressure per square inch, so that oil will not feed between the rubbing faces.

Hot boxes are often attributed to a faulty construction or mechanical defects in car trucks.

We believe that not as many hot boxes occur from mechanical defects in car trucks as is generally supposed. Even when the joints of the trucks of old cars become loose from wear and age, the journals will find an equilibrium of the meeting faces and will run without trouble if there is no direct disturbance of the faces in contact.

A brief review of the above conditions will show that in a few cases hot boxes are caused by improper care, a failure to look after worn-out dust guards and brasses, and to properly pack the box; or the use of poor oils; but in the majority of cases it is the peculiar condition under which the journal works that is the foundation of the difficulty.

The car journal as ordinarily constructed is unlike any other piece of machinery in use, and the same laws governing the action of other machinery at work cannot be applied to a car journal in service. The wedge and brass are laid on the top of the axle loose, and are held in position alone by the load which they support,

and whenever this load is removed the brass and wedge are free to move also. When the car is running it sways from one side to the other in passing over low joints, or track that is out of line. This swaying or rocking of the car relieves the bearing of its load, although only for an instant's time in each case, yet long enough to allow the end thrust of the axle to displace the brass or wedge, or a string of waste or other foreign substance to get between the brass and axle. (Sometimes both wedge and brass are thrown clear out of the box by this end thrust of the axle.) Any of these conditions, although very slight, will destroy the proper relation of the bearing faces. The displacement of the brass may also be caused by the jumping of the car trucks in passing over switches, railway crossings, by sudden stops or starts, such as occur in the yards when the cars are being switched to make up trains, or long and severe application of the air-brakes. The brass and wedge being out of their natural positions, they have an unequal bearing on the face of the axle, the arc of intended bearing is very much reduced, the oil does not lubricate and metal contact occurs. The pressure may be 400 or 500 lbs. per square inch where the brass rests on the axle, whereas oil will not feed between the rubbing faces when the pressure is more than 300 to 350 lbs. to the square inch. This generates heat, which carbonizes the oil and changes the meeting faces with every increased degree of heat generated, and if this unusual friction is not stopped at once, the face of the axle is roughed up and swollen out of shape. The heat forms a cone of friction, on account of the abnormal expansion of the axle at the center of its bearing in the line of the arch bars.

The portion of the face of the brass that has rested on the heated axle can easily be determined by its burned appearance and the rough, black, hard substance on its surface. This hard substance on the face of the brass is composed of the residuum of the burned oil, waste and cinders which have stuck to the meeting faces of the axle and brass while they were heated. The oil commonly used in lubricating journals is a hydro-carbon. The intense heat to which it is subjected causes the oil to undergo a chemical change. The heat consumes the lubricating portion of the oil and changes it from a free-flowing lubricating carbon to a solid carbon.

The hard, fixed, rough scales on the meeting faces interlock their sharp diamond points and resist motion. This resistance begins when the oil is evaporated and becomes of a thick tarry nature. The lubricating part of the oil passes off in smoke, and when the box takes fire all of this tarry liquid that comes in contact with the heated journal becomes solid. It becomes a highly oxidized carbon, and is made, by the heat and pressure to which it has been subjected, nearly as hard as a diamond; much harder than the metals of which the journal is composed. Sometimes this carbon will show itself in black, hard, burnished spots, in the line of the direct pressure in the center of the brass. These burnished spots are on the surface. It is carbon which has been deposited on the soft bed of babbitt. These spots are caused by a little string of waste or some other foreign substance becoming imbedded in the soft babbitt between the two meeting faces, causing an unequal bearing at that point. This spot takes up the oil, which is carbonized by the heat and pressure to which it is subjected. The smooth, hot axle acts as a burnishing iron where it comes in contact with this carbon spot. Sometimes the burnished spots are found plated with copper occasioned by the chemical changes made by friction and heat upon the oil and alloy. This carbon will at other times form into ridges on the face of the axle and brass, stop lateral motion and cut the axle.

Thurston, in his book on alloys, tells us that copper alloy has a powerful affinity for oxygen and carbon, and will unite with them chemically at or above a red heat, causing the alloy to become hard and brittle, and making it difficult to cast solidly. The conditions of a brass in a very hot box are as perfect as could be desired to have it absorb oxygen and carbon. Old brasses that come out of hot boxes are brittle and unlike they were before being heated, and they contaminate new metal when remelted with it. Old brasses that have never been heated do not show this loss of ductility and the hard, brittle condition mentioned.

All car journal boxes in use are so constructed that the arch bars or equalizers have their pressure immediately over the center of the wedge and brass. The wedge has an elevated center about the width of the arch bar, running at right angles to the bearing face of the axle, on which the load necessarily rests. The object of the wedge made in this way is to give the brass a chance to adjust itself to varying conditions.

Any pressure on the brass outside of the line of the arch bars is indirect pressure, and causes very little friction at the ends of the brass when the axle is hot. The normal arc of contact on an M. C. B. 3½ x 7 in. journal is 24½ in., and when loaded the normal pressure is about 290 lbs. to the square inch, but when the center of the axle is swelled by heat the arc of contact is reduced, and the pressure per square inch is increased in proportion to the reduced area of the meeting faces. It may be from 1,000 to 1,400 lbs. to the square inch when the journal is very hot. It is not unusual, when axles are at a white heat in the center of the bearing, that the face of the brass is melted. This causes an adhesion of the meeting faces. If stopped now and cooled suddenly, the axle is very likely to become brazed to the face of the brass, sufficiently firm in places where there is no carbon oxide on the face of the axle, to tear out of its face pieces of the metal. It is a very common thing, where the meeting faces are entirely free from a coating of carbon and the axle at a white heat, to see the axle and brass stuck so tightly together by being cooled quickly while standing, that the axle is twisted off when the car is again started. When the brass becomes welded to the face of the axle in this manner, the axle is always ruined. Any axle which has been running a long distance and been repeatedly heated and cooled quickly and new brasses put in a number of times is very liable to be crystallized and made brittle from internal stress. The burning point of lubricating oil is approximately 425 to 450 deg. Fahr. The heat in the axle being from 600 to 1,800 deg., some means must now be adopted other than oil to reduce the friction and carry away the heat. If the car is set on to a side track to cool the journal, the load on the journal will, in nearly every case, spring the heated bearing end out of line before it is cool. The load exceeds the supporting strength of the heated axle; but if the car is kept running and the axle cooled while revolving, the end must run to a center, and when cool it is straight.

The experience the writer has had in cooling hot boxes has convinced him that there is but one way that it can be done with safety and without loss of time and waste of material. The axle must be cooled slowly or it will be injured. If cooled while standing, the rough scale raised on the bearing face will make the journal run hot again, but if water is forced between the heated faces on to the swell in the center of the bearing, where

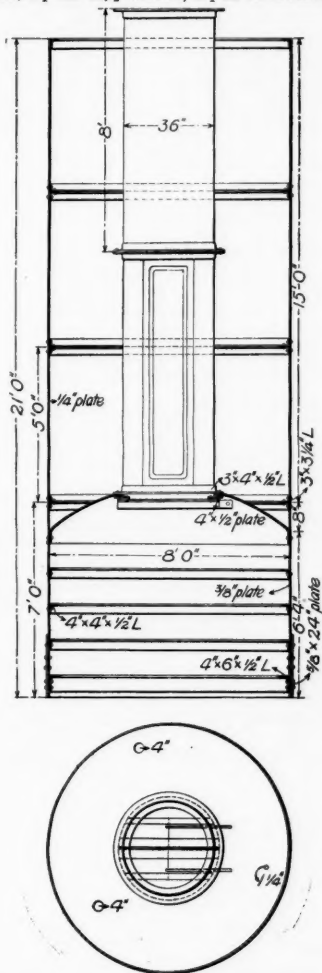


Fig 3—Steel Caissons for Mercantile Building Foundations.

hours, G_1 in 35 hours. It required 67, 72, 76½, 47½, 39, 50 and 47½ hours to sink A_2 , B_2 , C_2 , D_2 , E_2 , F_2 and G_2 , respectively. After the caissons were sunk the working chambers and the shafts were filled with concrete and the I-beam grillages placed on the top of the piers. The experiment was tried of loading a caisson with pig iron, in order to save the shaft, but it was found to be more expensive to put the pig iron in and then remove it than it was to load the caisson at first with concrete and sacrifice the shaft.

The north wall of the 5-story adjoining brick building had to be underpinned several feet below its original foundation. This was done after all the caissons along the wall had been put down. To do it, the wall was temporarily carried on needle underpinning and the foundation wall removed to a height of about 9 ft above the cellar bottom. A new foundation of Portland cement concrete was then put down. This consists of a continuous bed of concrete 5 ft. wide and 18 in. thick extending the whole length of the wall. The concrete bed extends 12 in. in the cellar of the adjoining building, and besides carrying the adjoining wall also carries the lining wall of the new building. The top of the concrete is on a level with the new cellar bottom and where it extends beyond the new lining wall into the new cellar, its top is lowered so as not to interfere with the cellar floor. In each of the spaces between the places where the needles went through the foundation wall, two sets of wedge blocks were inserted. Each set of these consists of two blue stones about 18 in. square and 6 in. thick, which are wedged apart with three and four pairs of steel wedges. The foundations at both the front and back corners of the building are strengthened by granite posts, one of which is inserted at either end of the wall. These posts each rest upon a foot stone about 4 ft. square placed on

* From a paper presented at the May meeting of the St. Louis Railway Club by Mr. M. P. Cook, Manager of The Cook Cooler Co.

the pressure is greatest, while the axle is revolving, it is cooled slowly, causing it to undergo an annealing process, which prevents danger of its being crystallized. The roughness caused by the carbon grit is ground loose and washed from the two faces; the expansion is reduced and the journal brought back to its normal condition without delay to the train injury to the axle or waste of material.

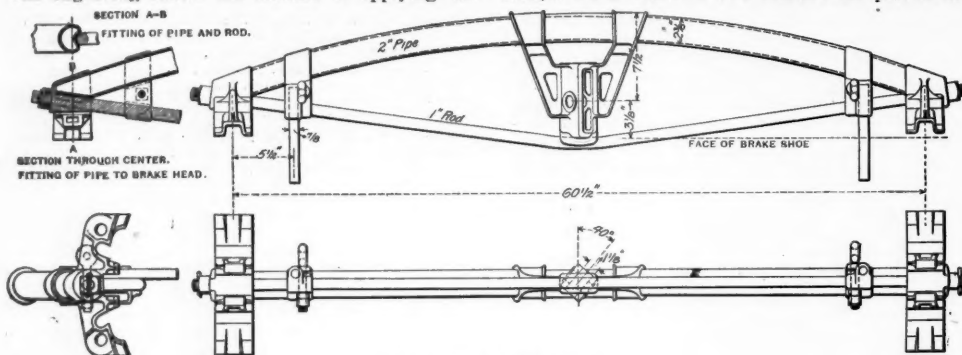
The water lubricant, unlike the oil or cooling compound, leaves no residue to burn and solidify on to the heated rubbing faces and make them rough, but on the contrary it loosens and dissolves the carbon scale already there, and with the pressure it is subjected to it is ground into a carbon emery, which, with the water, polishes the face of the axle the same as if placed in a machine for that purpose, and when the axle is cooled it is bright and smooth, with a uniform bearing.

The Monarch Brakebeam.

The accompanying illustration shows the improved form of Monarch brakebeam, made by the Monarch Brake Beam Co., Ltd., Detroit.

This beam consists essentially of a truss having a compression member formed of a steel tube 2½ in. outside diameter, while a 1-in. steel rod acts as the tension member. The strut is a malleable iron casting made in the form of a Y. The brake lever passes through the strut and is held in place by a pin.

The engraving shows the method of applying the



The Monarch Brakebeam.

brakehead to the beam, which consists in shaping the end of the pipe around the tie rod, while the brakehead is cast so as to go on the end of the beam and is held by the nut and pin at the end of the rod. The wheel guards consist of two malleable iron castings which fit around the pipe and tie rod and are held together by an eyebolt and nut. The eyebolt also engages a slot on the side of the ½-in. steel guard piece and so keeps it in place. The safety chains are attached to the eyebolts.

It is claimed for this brakebeam that when in place under a car it is balanced and on account of the manner of attaching to the beam the brakehead cannot turn.

Automatic Double Car Tenoning Machine.

We illustrate herewith a new machine for the car builder that shows an improvement in the methods of tenoning timbers such as end-sills, carlines, etc. With this machine both ends are cut to length, and either single or double tenoned, being fed through the machine on an automatic carriage, producing tenons that are square with each other. The saving of time and the accuracy are the great points claimed.

The housings are secured to a heavy sole plate. One of these housings is fixed in position, and the other moves automatically to and from it, thus governing the distance between shoulders of the tenons.

The automatic feeding carriage consists of two endless revolving chains carrying dogs against which the material rests, and propelled by gearing, and controlled by a ratchet lever. There are six speeds of feed. The dogs regularly furnished are 28 in. in diameter, 7 in. in length, and may be placed close enough together to work material as narrow as 6 in.

The tenoning heads are eight, two on each spindle; each carries two knives that will cut tenons 6 in. deep, so that by using two heads on each spindle a tenon 12 in. deep can be cut. The spindles are 1½ in. diameter, supported in heavy bearings and frame gibbed to the housings for a vertical adjustment by handwheel and screw of 12 in. The upper spindles also have a lateral adjustment for true alignment of upper heads with those on the lower spindles.

The vertical spindles are 1½ in. diameter, and are fitted with a special head for working double tenons to a depth of 4 in. The heads may be made any desired width, are adjustable on the spindles, and held firmly in the desired position by set-screws engaging a feather key. The spindles are of sufficient length to carry two or three heads at once, if special work requires it.

The machine will tenon material from 10 in. to 9 ft. between shoulders. It will cut off and tenon both ends of material up to 24 in. wide and 8 in. thick. By cutting off to lengths first on some other machine and dispensing with the saws on this one, timbers 12 in. thick may be tenoned. Saws 22 in. in diameter can be used.

The sectional pressure bars for holding the material down to the carriage as it passes the saws and cutter-heads are vertically adjustable for different thicknesses of material, and are also yielding for slight inequalities in thickness in timbers.

The countershaft is contained in the machine, has

16 in. x 10½ in. T and L pulleys, and should make 900 revolutions a minute.

This machine is made by Messrs. J. A. Fay & Co. Cincinnati, O.

Train Accidents in the United States in May.

COLLISIONS.

REAR.

5th, 5 a. m., on Wabash road, near Gilmore, Mo., a freight train descending a grade broke in two and the rear portion afterward ran into the forward one, wrecking five cars. A man in charge of a horse, and four tramps, were injured, and about 150 hogs were killed.

15th, on Atchison, Topeka & Santa Fe, near De Graff, Kan., a mixed train descending a grade broke in two and the rear portion afterward ran into the forward one, doing considerable damage. Two passengers were injured.

15th, on Vandalia line, near Plainfield, Ind., a freight train descending a grade broke in two, and the rear portion afterward ran into the forward one, wrecking 13 cars, which fell down a bank. A tramp was injured.

17th, on Atchison, Topeka & Santa Fe, at Colmor, N. Mex., the caboose and one car became detached from the rear end of a freight train on a descending grade, and afterward ran into the forward portion of the train, doing considerable damage. The conductor was badly injured.

20th, on Bangor & Portland, near Bangor, Pa., a freight train broke in two and the rear portion after-

ward ran into the forward one, doing considerable damage. A brakeman was injured.

28th, on St. Louis & San Francisco, at Aurora, Mo., a freight train descending a grade broke in two and the rear portion afterward ran into the forward one. The shock caused the explosion of a number of kegs of powder in one of the cars and 6 cars were wrecked, 3 of them being burned up.

And 13 others on 12 roads, involving 15 freight trains.

BUTTING.

15th, on Alabama Great Southern, near Hull's, Ala., butting collision of passenger trains, doing considerable damage; 6 passengers injured.

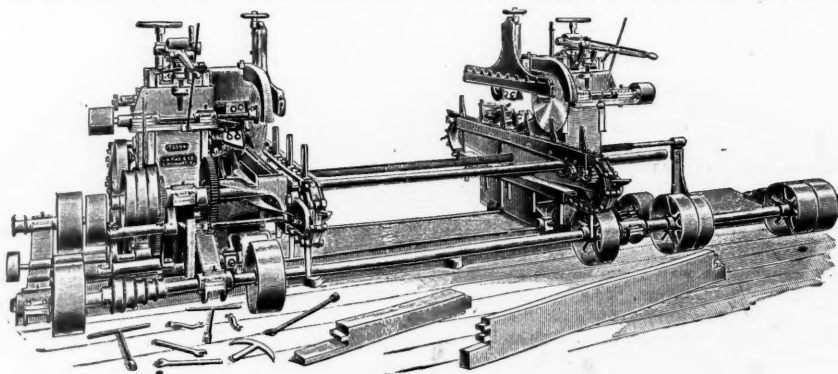
27th, 4 a. m., on Oregon Short Line, at American Falls, Idaho, a westbound passenger train standing at the station was run into by an eastbound freight train which had become uncontrollable on a descending grade, wrecking both engines, 20 freight cars and the station building. Five tramps riding on the freight train were killed and 4 injured; two employees and 1 passenger were injured. The air brakes of the freight train were inoperative, the air cock just back of the engine having been shut, presumably by the tramps.

28th, on Denver & Rio Grande, at Cabeza, Col., a passenger train ran over a misplaced switch and into the head of a freight train; both engines were badly damaged. The foremost cars in the train were badly damaged, most of them falling against the rocky mountainside adjoining the track. The engineman and fireman of the passenger train were killed and 6 passengers were injured.

And 3 others on 3 roads, involving 2 passenger and 4 freight trains.

CROSSING AND MISCELLANEOUS.

2d, on Chicago & Northwestern, near Evanston, Ill., a passenger train ran over a misplaced switch and collided with another passenger train, doing slight damage. Four passengers were injured, three of them being



Automatic, Double, Car Tenoning Machine.

scalded. One account says that the switch was out of order.

4th, on Chicago & Northwestern, near Clinton, Ia., collision of freight trains, wrecking two engines and several cars; one conductor was killed.

21st, on Manhattan Elevated, at South Ferry, New York City, a passenger train entering the station collided with another passenger train just going out, doing slight damage. One passenger was injured.

25th, on Atchison, Topeka & Santa Fe, at Glorieta, N. Mex., a car of a freight train switching on the main track eluded control and ran three miles out on the main track, colliding with a freight train. The car was wrecked and the engine badly damaged. A brakeman jumped off the engine of the freight and was injured.

And 4 others on 4 roads, involving 8 freight trains.

DERAILMENTS.

DEFECTS OF ROAD.

5th, on Oregon Short Line, near Rush Valley, Utah, a passenger train was derailed at a point where the rails had been forced out of line by expansion due to solar heat. The fireman jumped off and was injured.

16th, 5 a. m., on Atchison, Topeka & Santa Fe, near Marietta, I. T., a passenger train broke through a trestle bridge which had been weakened by a freshet and the whole train, except the engine and the rear car, was ditched. One trainman and 7 passengers were injured.

28th, on Pennsylvania road, at Fifty-second street, Philadelphia, a westbound passenger train was derailed in consequence of the breaking of a switch rod, and the engine was overturned. The engineman and fireman were killed. One passenger was injured.

28th, on New York, New Haven & Hartford, near Farmers, Mass., the engine of a passenger train was derailed by spreading of rails, at a point where the track had been recently repaired, and fell into the ditch. The engineman, fireman and express messenger were injured.

30th, on Baltimore & Ohio Southwestern, at Gibson, Ind., 12 cars of a freight train were derailed by a broken frog and 6 of them fell down a bank. The conductor jumped off and was injured.

And 4 others on 4 roads, involving 2 passenger and 2 freight trains.

DEFECTS OF EQUIPMENT.

10th, 11 p. m., on Pennsylvania road, at Thorndale, Pa., a drawbar of a car in a freight train was pulled out and fell upon the track, derailling 12 cars; two tramps were injured.

A passenger train, which passed the wreck a few minutes after the derailment, was badly damaged by one of the freight cars, which fell over against a passenger car and a Pullman sleeping car.

25th, on Kansas City, Pittsburgh & Gulf, near Joplin, Mo., a car in a freight train was derailed by a drawbar which was pulled out and fell upon the track, and the car which was then on or near a bridge, fell into the river. No other car was derailed.

29th, on Austin & Northwestern, near Liberty Hill, Tex., a passenger train was derailed by the breaking of an axle and the fireman was killed.

And 11 others on 9 roads, involving 1 passenger train and 10 freight and other trains.

NEGLIGENCE IN OPERATING.

5th, on Cleveland, Cincinnati, Chicago & St. Louis, at Iroquois, Ill., several cars of a freight train were derailed at a misplaced switch and a brakeman was killed.

18th, on Buffalo & Susquehanna, near Austin, Pa., a freight train was derailed at a misplaced switch and the engine and 6 cars fell down a bank. A brakeman was killed.

31st, on Atchison, Topeka & Santa Fe, at Deerfield, Kan., a freight train was derailed at a misplaced switch and the engine and 7 cars were ditched. The engineman jumped off and was injured.

UNFORESEEN OBSTRUCTIONS.

4th, 10 p. m., on Southern Railway, near Bluff City, Tenn., passenger train No. 2 was derailed by running over a horse, and the engine and baggage car were ditched. The fireman was badly injured.

7th, on the Union Pacific, Denver & Gulf, at Cheyenne, Wyo., the engine of a passenger train was derailed by a misplaced switch. It is said that the switch was thrown by brakemen of the Union Pacific road who hoped to secure the discharge of the men on the train, and thus make vacancies for which they themselves could apply. Another account says that the perpetrators of the deed were intoxicated.

8th, 3 a. m., on Atchison, Topeka & Santa Fe, at Lamar, Col., passenger train No. 6 was derailed, and the engine and first four cars fell into the water. The engineman and 2 tramps were injured. It is said that the track had been washed out of place by a waterspout.

31st, on Norfolk & Western, near Radford, Va., a freight train was derailed by rocks which had fallen upon the track from the mountain side. It is said that the loosening of the rocks was caused by an earthquake shock.

And 2 others on 2 roads, involving 1 passenger train and 1 freight.

UNEXPLAINED.

15th, on Beech Creek road, near Clearfield, Pa., a freight train was derailed, wrecking 2 engines and 4 cars. One of the firemen was injured.

24th, on Baltimore & Ohio Southwestern, near Lexington, Ind., 5 cars of a freight train were derailed. A tramp was injured.

And 12 others on 10 roads, involving 1 passenger train and 11 freight and other trains.

OTHER ACCIDENTS.

4th, on Chicago & Alton, at Chicago, Ill., 2 cars in a

passenger train were badly damaged on one side by a large stone hanging from a derrick, which swung against the train as it passed Twentieth street. Five passengers were injured.

4th, on Chicago & Alton, at Kansas City, Mo., the locomotive of a freight train was wrecked by the explosion of the boiler and the engineer was killed; the fireman was badly injured.

31st, on Norfolk & Western, near East Radford, Va., the locomotive of a freight train was wrecked by the explosion of its boiler; the fireman was killed and one brakeman and the engineman were injured, the latter fatally.

And 5 others on 5 roads, involving 2 passenger and 3 freight trains.

A summary will be found in another column.

Floods Along the Southern Railway.

Though the result of the Mississippi River overflow this year was disastrous, and the damage to railroad and other property was enormous, it was not so great as would be supposed, when we take into account the area of land and the mileage of railroads under water.

The Southern Railway enters the Yazoo delta near Greenwood, Miss., about 60 miles east of Greenville, running nearly east and west between these two points, crossing the low lands of Mississippi almost at right angles, and a little north of the center of the state, occu-

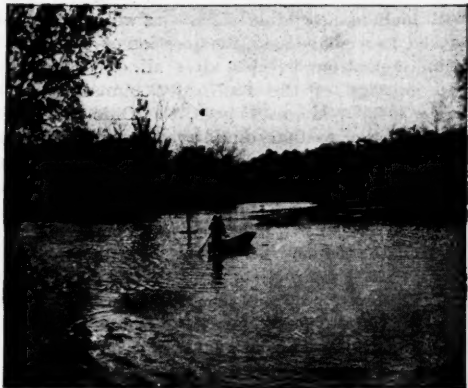


Fig. 1.—Mississippi River Flood Near Swain, Miss.

pying a position to receive the full force of the water as it came from the broken levees above. The construction of the road, however, was such that the damage done to the track and roadbed was reduced to a minimum. The builders of the road, whether from an engineering standpoint or from economy, kept their grade line on the ground, making no attempt at keeping above high-water mark. The result was the water soon rose over the track, carrying the current and drift above, leaving the roadbed undisturbed, except in two or three places, where the water had been obstructed, and held until, from increased head, it forced its way over and through the obstruction, carrying everything before it, until its force was spent in the fields and forests below. This was notably so at Jacks Bayou and Fish Lake, the only two points at which the Southern Railway sustained any serious damage.

Jacks Bayou is just east of the Yazoo & Mississippi Valley Railroad, which is built above high-water mark of 1882. This checked the water until it finally gave way in several places, throwing the current across the tracks of the Southern Railway. The washout at Fish Lake was not far south of the break in the levee which occurred just north of Greenville and here, again, the current was strong, but the water never rose very high above the track, the ground being higher than at other places.

The Southern Railway had nearly 38 miles of track under water, and although traffic over this part of the road was suspended for 41 days, there was only a little more than three miles seriously damaged and only one trestle of any importance out of shape. About two miles of track between Jacks Bayou and Elizabeth was washed off the embankment. The other points damaged were from washing out the ballast (cinder and slag), leaving the track suspended in places, varying in length from 50 to 500 ft. This was easily repaired, as the ballast was deposited only a little way from the ends of the ties in the old ditches made during the building of the road, and where the track had been removed entirely from the



Fig. 2.—Mississippi Flood at Jacks Bayou.

roadbed, near Jacks Bayou, the low fills enable the men to handle it in long sections and it was soon replaced. The pile trestles across Bogue Phalia, above referred to, was pushed out of line nearly 5 ft. by drift. The deck of this trestle was above the water just enough to make it impossible to control the drift, there being no means at hand to lift it over and it could not be forced under, the water being within a few inches of the bottom of the stringers. This trestle was caught by lines fastened to the timber above, using block and tackle to tighten it. As the water went down, the drift was removed, the tres-

tle pulled back into line and braced sufficiently to carry trains until additional piles were driven to make it as good as new.

A peculiar fact about this Delta country, well known to engineers, is that the streams occupy the high ground. This is clearly brought out along the line of the Southern Railway, which runs up grade in both directions to reach a trestle or bridge. This places the decks above water, and where the drift could be controlled the trestles were left intact. Although the country along this line is all below high water, it is undulating and so, many places were left high and dry several days before the water had passed off the lower places. The roadway department took advantage of this and at the first signs of dry ground organized its forces and began the work of repairing the track, most of the work being done with shovels, bars and jacks. By thus following the water as it went down they only had a few gaps to close when the water finally receded, and before the water was entirely off the track they ran a train into Greenville. The fills being low, it was not difficult to replace the ballast and put in temporary cribbing where the small waterways had been washed out, enabling the transportation department to make all schedules in a day or so.

The fact of the streams occupying the high ground has enabled the government engineers to build up a long line of magnificent levees, which, however, could not resist the pressure brought against them by the rapidly rising flood waters of this year. The Mississippi River, itself occupying higher ground than that immediately east, it will be noted that all the streams, for some distance, run either away from or parallel to the river, making it possible to build miles of levee without a break. This fact also sets the farmer and taxpayer to thinking, and causes them to cry out against the levee and clamor for the "outlet system." This means to open channels from the river to the heads of existing streams, open the streams themselves, allowing the water as much freedom as possible, that it may get off as fast as it accumulates. This means canals instead of levees, and it is claimed will give the landlord and tenant alike a better chance for his life and property, as he can watch the rise of the water each day, and begin in time to secure his stock and supplies against total loss by a raging flood which came upon him this year like a thief in the night, and swept away his accumulations of years of hard work, leaving him at the mercy of the uncontrolled waters which knew no mercy.

Other sections no doubt suffered as much or more than this, but the railroads, as usual, came to the rescue. The management of the Southern Railway took in the situation at once and began several days before the levees broke to make all necessary preparation to take care of the people and their property. The superintendent of the sixth division, Mr. A. J. Frazer, gave the subject much thought and devoted several weeks of his personal attention to it. He had placed at each station cars enough to take care of all the livestock and personal property of those who sought protection from the flood. Had it not been for this provision of rolling stock left on the tracks the suffering would have been greater than it was. The water came so rapidly and so unexpectedly that the people had only a short time in which to collect together a few of their household goods and take refuge in these cars, which were occupied, during the entire time the water was up, by man and beast of all kinds, colors and conditions. The government furnished provisions enough to carry them through this siege and though it has been only a month since the water disappeared there is no mark of flood, except that shown by the mud lines around the trees and along the sides of the houses. The fields are green with corn, cotton and other crops and the people seem as contented as if there had never been a flood. Such are the recuperative powers of the Delta.

Of the illustrations accompanying this, Fig. 1 was taken May 1 near Swain, 16 miles east of Greenville, and shows the condition of the water at its highest point at that place. The cross arm on the telegraph pole will give a clear idea as to the depth of water.

Fig. 2 shows the condition of the water on May 26 at Jacks Bayou. The road was opened on May 28, two days later.

Fig. 3 shows the condition of the track at Walnut Bayou, about a mile west of Jacks Bayou on May 26.

Fig. 4 was taken on May 26 near Fish Lake and shows the condition of the track at that point two days before a schedule train entered Greenville.

Had the embankments been higher and the trestles more pretentious, the damage to the Southern Railway would have been much greater, as was the case with other roads more expensively built.

B. C. MILNER, JR.

SELMA, Ala., June 25, 1897.

Street Railroad Changes in Baltimore.

The latest developments in the street railroads of Baltimore present several interesting features. Expansion of lines, improvement of facilities and consolidation of ownership are the phrases which best characterize the situation.

The new road, incorporated under the name of the Baltimore & Northern Electric Railway, has been under construction since May 1. It will connect with the City Passenger Railway at Lanvale street, in North Baltimore, and will pass along the Falls road and other

streets beyond the city limits to Pikesville, a part of the route in the county being over private right of way. At Pikesville the new line from the city will be united with the Pikesville & Emory Grove Railroad, the two lines forming a consolidated system, making a continuous line from the center of the city to Emory Grove, 22 miles in length. By short branches this line will run into Roland Park and Mt. Washington, thus drawing patronage from two of the largest suburban towns north of Baltimore. This will be a trolley line.

The Columbia & Maryland Railway Company is engaged in special efforts to complete its line between Baltimore and Washington. A mortgage of \$6,000,000 was executed a few days ago on the property of the road, securing a new issue of bonds. The Baltimore &



Fig. 3.—Southern Railway at Walnut Bayou.

Catonsville Construction Company, which had the contract to build this line, went into receivers' hands about nine months ago. With the new issue of bonds work can be resumed and carried on to completion. The line is nearly ready for operation to Ellicott City, foundations of the power-house at Ilchester having been laid last year. From the Washington end some work has been done. The future of this road is a subject of much speculation among capitalists and business men in Baltimore, and the famous "boulevard" is regarded by many as one of the most precarious experiments ever undertaken by an electric railroad company.

The latest improvement of electrical traction within the city of Baltimore is the recent change of motive power on the Blue Line of the City Passenger Railway Company. This line extends from the center of the city into the northern annex, passing along Charles street and through the wealthiest part of the city. When the change from horse cars was made six years ago great opposition to the trolley system was developed and the line was cabled. The City Passenger Railway Company began agitating the question of change to electricity three years ago. The scheme was fought by rich property holders along Charles street, and it was not until last March that the legal complications in the case were settled. Finally, however, the company triumphed and the trolley equipment was immediately put in place. The new motive power has been in operation since June 10.

But by far the most important street railroad change is the consolidation of the Baltimore Traction Co. with the City & Suburban Railway Co., the two largest street railroad companies in Baltimore. The new corporation is known as the Consolidated Railway Company, having a capital stock of \$10,000,000, and an authorized bonded debt of \$12,000,000. The new system has 184 miles of track, embracing extensive lines within the city and those reaching to considerable distances outside. Every part of Baltimore also is traversed by the tracks of this system,



Fig. 4.—Southern Railway Near Fish Lake, Miss.



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EDITORIAL ANNOUNCEMENTS.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Railroad gross earnings for June show an improvement over June of last year, but the gain is less than that shown in May earnings. According to the *Chronicle's* compilation, the increase in gross earnings in the month of June, as compared with 1896, was 2.17 per cent. or \$816,565. This was on 120 roads, representing 94,957 miles. The increase in May was 5.14 per cent.; in March and April it was about 1½ per cent. each, and in January and February there was a decrease, January showing a falling off of 6.78 per cent. For the half year there is an apparent decrease as compared with 1896 of \$1,266,174, or 0.3 per cent. This will probably be changed somewhat when more complete returns are in, as full returns for six months are received for only 121 roads and for many of the roads included in this compilation comparable returns are in for only five months.

A butting collision of passenger trains at Vandalia, Ill., on the evening of June 29, killing two men, which has received, perhaps, more than its due share of attention because of the presence on the train of California excursionists and because two such excursionists were killed on another road the same night, was attended by somewhat peculiar circumstances. As in most butting collisions, either one of two (or more) possible preventives would have been effectual if brought into action. In the first place, this road—the Vandalia line—is supposed to use electric headlights on all its night passenger trains, and the engines of these two trains were both equipped with such lamps, but for some reason they were not burning. An arc-light on one of the engines would probably have prevented the collision, for a light of this kind often acts as a more effectual monitor to the engineman running toward it than to the runner of the engine on which it is fixed. It will produce a pencil of light in the sky several miles long and thus announce its approach, even in spite of the intervention of hills or buildings, if these are not very high. Then the conductor (who, with all his crew, has been dismissed) almost stopped the train. That is to say, he pulled the air signal to warn the engineman that the meeting point was being passed, but he did not do this quite soon enough. This instance illustrates the value of the Queen & Crescent road's rule, noted in the *Railroad Gazette* of June 18, that the conductor of a passenger train must always, on approaching every meeting point, communicate with the engineman by means of the air-signal. This rule is somewhat derogatory to the dignity of the engineman, and it puts some little burden upon the conductor, but if trains are not to be kept apart by a space interval it is, apparently, the only effectual safeguard. If enginemen do not like to be thus frequently reminded of their fallibility, they can reflect that they ought long since to have made such a good record that the Superintendent would not have thought of adopting this expedient. If enginemen would themselves rigidly enforce

the rule requiring communication between engine man and fireman at all points where it may be dangerous not to stop the train, they would greatly enhance their reputation as a body and perhaps sometimes save lives.

The public and the railroads (as well as the street railroads) of the country are to have the benefit once more of the services of Charles Francis Adams, Governor Wolcott, of Massachusetts, having appointed him as one of the committee, ordered by the last legislature, which is to investigate the relations between cities and towns and street railroad corporations, the taxation of street railroads and their franchises in Massachusetts and in other states and countries, and the need, if any, of legislation to establish a more fixed tenure of franchises of street railroads and an equitable method of taxing them. The other members of the committee are William W. Crapo, of New Bedford, and Elihu B. Hayes, of Lynn. Mr. Crapo is well known as the President of the Flint & Pere Marquette. He is interested largely in other railroad properties, and has been a member of Congress. Mr. Hayes has been Mayor of Lynn, and a prominent member of the state legislature. The chairman of the committee is to receive \$3,000, and the other two members \$2,500 each. One half of the expense of the committee is to be assessed against the street railroads of the state, and paid by them as a tax. The committee must report to the legislature by Feb. 2, 1898. Some of the street railroad men of Massachusetts express disappointment that the first two members of the committee are experts in the management of standard railroads rather than in that of electric roads; but all recognize that they are experienced publicists and men of high character. To get these qualities, combined with years and wide reputation (Mr. Adams is 62 and Mr. Crapo 67), might not have been an easy task if the search had been made among men possessing intimate knowledge of the comparatively new business of electric railroading. Mr. Adams' ten years' experience on the Massachusetts Railroad Commission is a sufficient guaranty that he is familiar with the transportation needs of the state, as well as with its general policy of municipal government; though to those who know him no guaranty is needed; his public spirit simply as a citizen is sufficient assurance of good service.

An investigation like that to be made by this Massachusetts board is greatly needed. Numerous intelligent students have, indeed, during the past year or two, discussed the relations between cities and street railroads; few if any of them have, however, investigated every branch of the subject thoroughly and none have enjoyed at once the facilities to get widely scattered facts, the reputation which inspires general confidence and the ability to clearly state conclusions; these are requisite conditions for the production of a valuable report. Moreover, many of the problems which perplex city officials and street railroad owners seem, from what light we now have on them, to be susceptible of settlement only after patient study of numerous local conditions peculiar to each case, so that the general essayist finds it beyond his power to prescribe remedies for some of the most serious difficulties that he discusses. The need, then, may prove to be chiefly for a report setting forth principles, with instructions for applying them to specific cases. Such a report, making the whole subject clear to inexperienced town officers and to the average alderman, will be received with appreciation everywhere; and again, as in former years, the whole country will be indebted to Massachusetts for practical lessons in political economy. Every steam railroad which is losing or is likely to lose business because of the establishment of new street railroads is practically interested in this matter, for on the equitable settlement of the question of taxation of the new competitor depends, in large measure, the question whether the competition is to be fair or unfair.

Most of the state laws requiring or permitting interlocking signals at grade crossings of one railroad with another throw the chief responsibility for safety on the State Railroad Commissioners. To specify in a statute all the conditions to be complied with at innumerable different crossings would be out of the question and the requirement that the apparatus shall be made to meet the approval of a qualified state official is therefore the best practicable method of dealing with the problem in a statute. The official must, however, be really intelligent, and well posted in the technical requirements of crossings,

and must be possessed of backbone as well, if he is to do justice to all concerned in such an important matter. According to the *Columbus State Journal*, the Railroad Commissioner of Ohio has recently gone to the Century Dictionary to find out what to do in the matter of signals at a highway crossing where electric cars cross the Cincinnati, Hamilton & Dayton road; or, rather, he has applied to the Attorney-General; and that officer has expounded the law by citing the Century definition of interlocking signals. As is generally the case when one goes to a dictionary, the definition is found to be so broad that it will include unsuitable signals as well as suitable; and so, as we have said, the question of getting adequate protection depends, after all, on the wisdom and courage of the Railroad Commissioner. So far as specific language goes, the Ohio law simply requires "a system of interlocking" or "other works or fixtures" by which the crossing of trains without stopping can be made safe; and home signals on each line six inches from the fouling point might be construed technically as complying with it; and the Century Dictionary defines interlocking signals as those "connected with and controlled by the switch mechanism in such manner that any movement of the switches operates the proper signal"; so that preliminary looking and distant signals and derailing switches might all be omitted and still satisfy the law, unless the Railroad Commissioner had some better guide than a lawyer and a dictionary. Moreover, the kind of signal, whether high or low; the location, whether near to or far from the fouling point, and the necessity or non-necessity of derailing switches, must be decided largely by the speed of the trains and of the street cars using the crossing, so that the intelligent supervision of a Commissioner is needed, not only to approve mechanical devices, but to require the establishment of suitable regulations for using them. The observance of such regulations should be a condition of his approval of the signals. The reader will note, in passing, that the Century definition is not only insufficient, but inexact, if it is to be applied to railroad signals as they are. As this dictionary is not very old, the definition gives rise to the suspicion that the department embracing this subject was edited by a man not practically acquainted with signals; otherwise he would have said that a movement of the switches "actuates locks which permit the operation of the proper signal."

Coupler Locks and Lock Lifts.

A very interesting report was presented at the Master Car Builders' Convention by the Committee on "Trains Parting." Statistics were obtained from 31 railroad companies, representing 37,000 miles of road and 376,000 cars, which statistics showed that in 105 days there were 5,775 cases of trains parting. Of these, 103 cases were accompanied by serious damage, and in some cases there was loss of life. If we could reason from these facts to the whole railroad mileage of the United States by simple proportion we might say that there were in the United States 275 cases of trains parting every day. But of course this is only a conjecture and not even an approximation. If the committee had given the freight-train mileage, a safer estimate of the total of this class of accidents might be made.

We judge that very few people were prepared to hear that this kind of accident is so common. But most of these cases occurred at 20 miles an hour, or under, and many of them just as the trains were pulling out, and the damages were very often so small that they did not get reported in the newspapers and consequently were known only to those immediately concerned. Some of the most disastrous freight accidents do come from this cause, however. Railroad men do not need to be told how formidable this kind of accident may be, at night, on a down grade, when the men on the rear of the train do not find out promptly what has happened, and especially when the forward cars have air-brakes.

Of all the cases reported by the committee, 2,593, or 45 per cent. of the whole, were with link-and-pin couplers. Of the remaining 3,177 cases, 708 were from broken coupler spindles, 86 broken coupler pockets, 228 defective draft rigging and 2,155 (37.3 per cent.) failure or defects in M. C. B. couplers or their attachments. Here again we are met by incomplete statistics. We do not know what proportion of the cars concerned had link-and-pin couplers and what proportion M. C. B. couplers, and, therefore, have no measure of the relative liability of the two kinds of couplers to this kind of accident, but we have no doubt that the committee is quite right in urging the complete abolition of the link-and-pin.

Out of the 2,155 breaks with the M. C. B. coupler 886, or 41 per cent., of this group, were from broken

or defective locks; 682, or 81 per cent., from excessive slack in draft rigging; and 234, or 11 per cent., improper adjustment of lock lifts. We are surprised at the large number of breaks due to defective locks. Of course everybody who has watched the matter has been aware that many M. C. B. coupler locks are inefficient, but we doubt if anybody, except those whose duties have led them to watch the matter personally, had any adequate notion of the number of accidents due to defects of this kind.

The accidents due to slack in draft rigging and defective uncoupling attachments (let us say lock lifts for brevity) the committee in its comments groups together in one class, making 906 cases, or 42 per cent. of all the M. C. B. failures. It is very likely that the three groups, defective locks, excessive slack in draft rigging and imperfect lifts overlap each other, and that the reports did not discriminate very accurately in classifying the accidents due to these three causes. It is quite possible that some of those laid to slack in draft rigging should properly have been laid to defective locks or defective lifts, or vice versa. But without going into the matter too closely, it is quite evident that there is a chance here for some very useful study and work, not only among the members of the M. C. B. Association, but among coupler makers as well, and particularly among coupler makers. In the brief discussion of this report Mr. Waitt said that "the uncoupling attachment overhead is all wrong. It is time for manufacturers to study out some device for the locking attachment, so that the uncoupling arrangement is not directly connected with the coupler, and excessive slack in the draft rigging will not cause the lock to open."

With some of the locks there is no difficulty in applying a lock to a lock, which, in fact, has been successfully done. In some of them this is impracticable, but there seems to be no insurmountable difficulty in fixing standard positions and dimensions for the lock lift, which will obviate at least the trouble of pulling the lock open, although of course this would not prevent the lock from pinching or jumping up.

With a view to standardizing the uncoupling attachments a committee on that special subject made some recommendations which have now gone out for letter ballot for adoption of recommended practice. The arrangement recommended is shown on another page, along with the abstract of other questions sent out for ballot. We shall not attempt any analysis or criticism of the proposed arrangements which have been devised by an able committee and subjected to the scrutiny of the Association in convention. We must assume that it is the best that can be done now.

May Accidents.

Our record of train accidents in May, given in this number, includes 33 collisions, 46 derailments and 8 other accidents, a total of 87 accidents, in which 16 persons were killed and 65 injured. The detailed list, printed on another page, contains accounts only of the more important of these accidents. All which caused no deaths or injuries to persons are omitted, except where the circumstances of the accident, as reported, make it of special interest.

These accidents are classified as follows:

COLLISIONS.	Rear.	But- ing and others.	Cross- ing and others.	Total.
Trains breaking in two.....	17	0	0	17
Misplaced switch.....	0	1	1	2
Failure to give or observe signal.....	0	0	0	0
Mistake in giving or understanding orders.....	0	0	0	0
Miscellaneous.....	1	1	4	6
Unexplained.....	1	4	3	8
Total.....	19	6	8	33

DERAILMENTS.	Misplaced switch.....	Animals on track.....	Landslide.....	Washout.....	Malicious obstruction.....	Unexplained.....
Loose or spread rail.....	5	1	1	1	1	1
Defective bridge.....	1	1	1	1	1	1
Defective switch.....	1	1	1	1	1	1
Defective frog.....	1	1	1	1	1	1
Distorted track.....	1	1	1	1	1	1
Broken axle.....	5	1	1	1	1	1
Broken truck.....	2	1	1	1	1	1
Failure of drawbar.....	7	1	1	1	1	1
Total.....	46	1	1	1	1	1

OTHER ACCIDENTS.	Boiler explosion.....	Broken side rod.....	Cars burned while running.....	Other causes.....
Boiler explosion.....	2	2	2	2
Broken side rod.....	2	2	2	2
Cars burned while running.....	2	2	2	2
Other causes.....	2	2	2	2
Total.....	8	8	8	8

Total number of accidents..... 87

A general classification shows:

	Colli- sions.	Derail- ments.	Other accid's.	Total.	P. c.
Defects of road.....	0	9	0	9	10
Defects of equipment.....	17	14	5	36	42
Negligence in operating.....	8	3	2	13	15
Unforeseen obstructions.....	0	6	1	7	8
Unexplained.....	8	14	0	22	25
Total.....	33	46	8	87	100

The number of trains involved is as follows:

	Colli- sions.	Derail- ments.	Other accid's.	Total.
Passenger.....	10	14	3	27
Freight and other.....	23	32	5	60
Total.....	33	46	8	87

The casualties may be divided as follows:

	Killed.	Colli- sions.	Derail- ments.	Other accid's.	Total.
Employees.....	3	0	5	3	11
Passengers.....	0	0	0	0	0
Others.....	0	0	0	0	0
Total.....	3	0	5	3	11
Injured:					
Employees.....	5	10	2	17	33
Passengers.....	20	8	5	33	66
Others.....	10	5	0	15	30
Total.....	35	23	7	65	125

The casualties to passengers and employees, when divided according to classes of causes, appear as follows:

	Pass- Killed.	Pass- Injured.	Emp- Killed.	Emp- Injured.
Defects of road.....	0	8	2	6
Defects of equipment.....	0	0	4	2
Negligence in operating.....	0	20	5	6
Unforeseen obstructions and maliciousness.....	0	0	0	2
Unexplained.....	0	5	0	1
Total.....	0	33	11	17

Nine accidents caused the death of one or more persons each, and 20 caused injury but not death, leaving 50 (67 per cent. of the whole) which caused no personal injury deemed worthy of record.

The comparison with May of the previous five years shows:

	1897.	1896.	1895.	1894.	1893.	1892.
Collisions.....	33	34	47	42	68	61
Derailments.....	46	73	58	54	102	72
Other accidents.....	8	2	6	4	6	8
Total accidents.....	87	109	111	100	176	141
Employees killed.....	11	17	16	30	39	36
Others killed.....	5	15	9	4	27	30
Employees injured.....	17	39	62	70	94	109
Others injured.....	48	37	65	41	81	114
Passenger trains involved.....	27	25	34	41	49	47

	2.80	3.52	3.58	3.23	5.68	4.55
Accidents.....	2.80	3.52	3.58	3.23	5.68	4.55
Killed.....	0.84	1.03	0.81	1.10	2.13	2.16
Injured.....	2.10	2.45	4.10	3.58	5.65	7.06

	0.18	0.29	0.22	0.34	0.37	0.47
Accidents.....	0.18	0.29	0.22	0.34	0.37	0.47
Killed.....	0.74	0.70	1.14	1.11	0.99	1.55
Injured.....	0.74	0.70	1.14	1.11	0.99	1.55

The record for May shows not only an entire absence of fatal injuries to passengers, but a pretty low record of fatal injuries to employees, the total number of persons killed being much below the average. The number of employees injured, 17, is the lowest total in that column that we have ever recorded. While the record of injuries to employees is perhaps the least reliable of any of the items in our table, and while its value is also impaired by the fact that the proportion of cases which we never hear of is perhaps greater in this item than in any other, still the presence of a large number of items in this column is a regular thing month by month, and this unusual showing is quickly noticeable. Seldom has this column failed to show more items than any other, and the total this month, 17, is only about one-fourth the average for the past five years. Yet, we cannot see but that our scissors editor has searched the exchanges as carefully during May as at any other time.

The butting collision at American Falls, Idaho, on the 27th, has already been mentioned in these columns. There seems to be no doubt in the minds of the officers of the road that the non-action of the air-brake on the freight train in this collision was due to the closing of the train pipe cock by the tramps who were killed.

Of the nine accidents which caused the death of one or more persons each, the two worst ones involving passenger trains were those at Philadelphia on the 28th and at Cabeza, Col., on the same date. A passenger train was wrecked near Marietta, I. T., and a number of passengers were injured, but none killed.

We have reports of eight accidents to electric and cable cars in May, in which 15 persons were injured. There were three collisions, three derailments and one case of a car being run into by a locomotive.

At Valley Stream, N. Y., on the 31st, a coach crossing the track was run into by a passenger train of the Long Island road and five persons were killed.

A coroner's jury can generally tell whether a corpse is dead, and can declare the fact; but beyond this it is hard to see what such juries amount to. We have recently noted the crude deliverance, called a verdict, in the case of the disaster at Valley Stream, L. I. Not until the grand jury reported did the public have any official information on that case which was worth notice. Last week a coroner's jury at Mount Vernon, N. Y., returned a similarly childish verdict. A station baggageman was killed while crossing the track in front of the station by the second section of a fast express train, and the juryman says that "the accident was due to the contributory negligence of the railroad company, by reason of their not properly notifying their employees of the approach of the second sections of trains." Yet it appears that the first section carried green flags and that the unfortunate baggageman was within view of the block signal, which had been pulled off for this train before it came in sight. Moreover, with suitable caution he could have both seen and heard the train in season to save himself, there being no unusual distracting circumstances. If every newspaper reader realized how farcical the deliberations of coroner's juries generally are, such verdicts as this might perhaps do no harm; but with the solemn legal verbiage generally used in verdicts, and the popular respect for any instrumentality or function apparently so dignified, the possible amount of misinformation conveyed to the public is very great.

The system of giving premiums to engine crews for oil and coal saving is not without its difficulties even in

Germany and Austria. In some quarters, the officers of the Operating Department seem satisfied with the results, while on the part of the enginemen there is not entire satisfaction; and the men complain that the premium for oil and coal saving is the same on all divisions of the road; and that under the different conditions of operation that obtain on various divisions, it is impossible for a crew on one to earn as much as on another. Where the system has been longest in use, more general satisfaction is felt with it; and this is particularly the case where the officers and men have been able to arrange the matter by mutual agreement, and unhampered by ministerial interference. This latter factor, as a disturbing influence, is not to be overlooked in forming a judgment on any question concerning German railroad affairs; and, furthermore, in comparing the conditions of operation that exist here with those on the other side of the water, the difference in management and the deference of the European officers to the heads of governmental departments controlling the railroads all go to sometimes reverse the effect of any one line of policy as laid down in the one country or the other.

The feature of the coal miners' strike during the past week, so far as the reporters are concerned, has been the action of the railroads in using consignees' coal for locomotives. The miners and their representatives have held various conferences, and the state arbitrators of several states have met at Pittsburgh, but at the time of going to press we have no news of any definite result. The miners of West Virginia are still practically all at work, so far as can be learned, and Western cities usually depending on Ohio expect to get all necessary supplies from that state, though the newspapers in Cleveland and Chicago have had many scare headlines about a possible coal famine. The reporters have consulted various consignees of coal to see how they felt about the seizure of their coal by the railroad, but no specific complaint was brought out. There was a report at Cleveland that the Ohio railroads had refused to haul coal from West Virginia, but there does not seem to be any foundation for it. The Ohio railroads most severely affected by the strike have laid off men wherever possible, in order to reduce expenses, and the Columbus, Hocking Valley & Toledo took off some passenger trains.

Dr. Holland once said that rum and railroads go together. We might add that rum and most things go together, as, for example, a little sugar and lemon and a very little water. But that aside, religion and railroading do not generally seem to have much connection with each other, except, perhaps, at the annual meetings of Railroad Young Men's Christian Associations, when railroad presidents make speeches, but out in Colorado the church-fair idea has been applied to railroading with signal success. Whether a church fair is a religious institution is another question. The Denver & Rio Grande has run an excursion which gave the road a good profit and at the same time paid a \$1,000 debt for the Denver Y. M. C. A. As a 10-cent plate of ice cream will gladden the palate three cents' worth, pay expenses, and still leave three cents for the church, so a \$40 ticket through the Royal Gorge and Marshall Pass affords a pleasant ride of 1,200 miles, pays for fuel and wages and enables the railroad company to aid in cleansing the moral atmosphere of Denver without feeling it. From a correspondent we learn that this scheme was got up by Mr. C. M. Hobbs, Purchasing Agent of the Denver & Rio Grande. Mr. Hobbs is an active friend of the Y. M. C. A., and after conferring with President Jeffrey he announced that if 100 tickets could be sold the company would give \$1,000 to the association. The local newspapers gave the excursion a good lift, Mr. Hobbs delivered a stereopticon lecture in the largest church in the city descriptive of the scenery to be viewed upon the proposed excursion, and when the train started last Tuesday the full quota had been secured. The route taken is the noted "circle trip." On this occasion the trip was made in a special train of Pullman sleeping cars (narrow gage) and all meals were served in a dining car, a day coach having been fitted up as a kitchen and commissary. The train moved only by daylight, taking sidings during meal hours and stopping at night at convenient points. It left Denver Tuesday morning and will return Saturday evening. During that time the tourists will view 1,200 miles of the mountain, valley and plains country along the line of the Denver & Rio Grande and the Rio Grand Southern, the Royal Gorge, Toltec Gorge, the Canon of the Animas above Durango, Ophir Loop, the picturesque mining towns of Telluride and Ouray, a stage ride up Uncompahgre Canon above Ouray, Black Canon of the Gunnison and Marshall Pass. The price (\$40) included sleeper and stage fares and all meals for the five days.

For several days last week the newspapers were busy announcing the sale of the Northern Railroad of New Jersey, the developments of the theory being that it would be trolleyized within a year or that it would run into the Pennsylvania station, or several other things. So far as we can ascertain, it is true that a controlling interest in the stock has been sold, but we are yet in the dark as to what are the purposes of the purchasers. The Northern owns 2 1/4 miles from Bergen Junction, just west of the Erie tunnel, north to Sparkill, and leases 4 1/2 miles more as far north as Nyack. Since 1869 it has been operated by the Erie under an agreement onerous to the Erie, made in the bad days of Jay Gould,

The Northern fixes rates of fare and train schedules. The Erie furnishes rolling stock, and in fact all the material for operating the railroad, and pays a certain fixed percentage of the gross receipts. That which remains may or may not yield a profit after paying working expenses. At the time of the reorganization of the Erie, the present control repudiated the agreement as being unfavorable, and the tentative agreement is terminable on 90 days' notice from either party. The Northern cannot get to the river and the New York ferries except by agreement with some other company. A connection could be made with the Susquehanna & Western, thus running trains into the Pennsylvania terminal, or with the West Shore, which, however, would give a long downtown ferry, and an inconvenient uptown ferry. The road could be changed for electrical working, but then the difficulty of getting a river terminus would be still greater. It would be impracticable to run into either the Erie or the Pennsylvania depots unless some very different method of transmission is used from anything now in railroad service. The road has an important suburban business, serving the popular and prosperous town of Englewood and many smaller stations. At present there are 25 trains run one way and 27 the other daily.

NEW PUBLICATIONS.

An Elementary Treatise on Heat and Heat Engines, especially adapted for engineers and students in engineering. By W. C. Popplewell, M. Sc. Assoc. M. Inst. C. E. Manchester: The Technical Publishing Co. (Ltd.), 31 Whitworth street. Price 6s. (\$1.50), net. This book contains a careful and thorough treatment of the theory of heat engines together with many practical considerations. The matter having appeared originally in the columns of the *Practical Engineer*, (London) has received careful revision and is almost entirely free from typographical errors. In presenting the subject, the author has aimed to state the matter so that the practical engineer and the student will be able to master the more simple solutions, and by following the steps which are carefully laid out in the book, the more difficult analysis should be understood.

The author has kept in mind the necessity of presenting the subject so that the importance of the theoretical considerations will not be overlooked and the practical side will not be neglected. In carrying out this purpose the subject of heat is first discussed in an elementary way and this is followed by considerations of compressed air and its uses. Following this, hot air, gas and oil engines are treated at some length. Mr. Popplewell gives some practical suggestions of the best method of making calculations of a gas engine trial, and later discusses the future of the gas engine as compared with the future of the steam engine. He believes that the gas engine will be greatly improved along certain lines and shows that even now a comparison of the two is not altogether unfavorable to the gas engine. The steam engine, its construction and theory, is considered in the last part of the book. This being the most difficult subject to master, the author has left it until the engines in which the working fluid is a perfect gas has been fully discussed.

There is very little in the book that can be called new or novel, and this is especially true in regard to the development of the subject of the steam engine, the substance and general style of treatment of which is similar to that found in some of our American textbooks. The author uses 772 throughout the book as the value for the mechanical equivalent of heat, whereas some of the more recent works published in this country (including Peabody's and Wood's *Thermodynamics* and Kent's *Mechanical Engineers' Pocket-Book*) have adopted Rowland's determination of 778, which is unquestionably the more accurate value. For uniformity, this value should be adopted universally and since the higher value is regarded as the nearer correct, it seems inconsistent for any writer who desires to publish only the most reliable results to continue to use the lower value.

American Street Railway Investments. Edition of 1897 corrected to June 15. New York: The Street Railway Publishing Co., 26 Cortlandt St. Price \$3.

This handbook of the street railroads has now been published for several years and must be pretty well known to everybody who has occasion to seek for the kind of information that it contains. A new feature this year is a table showing the gross receipts of individual companies for 1895, also 1896. The companies, the receipts of which were over one million dollars each, show an increase of receipts in 1895 of 6.67 per cent. The companies having gross receipts of from \$500,000 to a million show about the same ratio of increase. Those having gross receipts of from \$100,000 to \$500,000 increased in the aggregate 12.14 per cent. The companies having receipts from \$25,000 to \$50,000 (the aggregate of which was only 1½ millions) increased 15.94 per cent. It is a curious and interesting circumstance that out of the 195 street railroad companies named in this table only 37 showed decreases in their gross receipts, and these decreases were all small. They run from 0.59 per cent. up to 17.45 per cent. The increases run up to 124 per cent. The volume contains many maps which are on such scale as to be really useful to anybody who has occasion to look up the facts.

The editors say that direct information has been received for use in this manual from over 80 per cent. of the companies reporting. In all cases each company has had opportunity to correct errors in its report. The date of the information published is given in every case.

TRADE CATALOGUES.

The Dayton Manufacturing Company, Dayton, O., has issued a new catalogue of 71 pages, descriptive of the locomotive headlights and torches, switch, signal, water gage and cab lamps, which it manufactures.

The Cincinnati Corrugating Co., Piqua, O., sends its new illustrated catalogue describing the roofing, siding, arches, metallic lath, shutters and doors, awnings and the general line of sheet metal workers' supplies which it furnishes. Several new items have been added since the last issue, making it one of the most complete lists of such goods to be had.

Hudson River by Daylight is the familiar excursion book of the Hudson River Day Line of Steamboats, giving lists of summer resorts in the Catskill and Adirondack Mountains and other regions to which these boats carry passengers. Like other enterprising books, it comes out this year with many additional pictures, there being 25 or 30 full-page direct-process cuts.

Compressed Air and the Clayton Air Compressors is the title of Catalogue No. 9, issued by the Clayton Air Compressor Works, with offices in the Havemeyer Building, 26 Cortlandt street, New York City. Detailed descriptions are given of the Clayton compressors as adapted to many varieties of work where compressed air is used. These compressors having been in use now for over 25 years, their quality and excellent finish are well known and need no extended description. The catalogue contains, in addition to an illustrated description of the features of the Clayton type of air compressor, illustrations and lists of sizes of the standard patterns of compressors, and a descriptive article on the Widening Use of Compressed Air, showing its various applications, together with cuts and descriptions of compressed-air tools and appliances. Among the other contents will be found valuable data for figuring the loss of pressure due to friction and transmitting compressed air through pipes, and the capacity lost by air compressors in operating at various altitudes above the sea level. Air receivers, vacuum pumps, flywheels, steam pumps and compressors for testing under high pressure are all fully described. The advantages of the Clayton compressors in what is known as the Pohlé air-lift pumping system are especially referred to. The success of this method of pumping is dependent for the most part on the economy and efficiency of the compressor. This method of pumping air will be found fully described in the *Railroad Gazette* of Nov. 10, 1893. It is interesting to note with what favor this method, as adapted to the Clayton compressors, has been received, as expressed by the many letters republished in this catalogue. The Monarch rock-drill is also described, and a price list and descriptive table are given. The catalogue will be sent on application.

Iowa Railroad Commissioners' Report.

We have just received the nineteenth annual report of the Board of Railroad Commissioners of the state of Iowa, the same being for the year ending June 30, 1896. The report discusses express companies, which have recently been placed under the supervision of the Railroad Commissions; joint through freight rates, the National Convention of Railroad Commissioners and uniform classification of freight. The Commissioners are cautious about expressing opinions on classification, or, in fact, on any subject. On the subject of farm crossings a long decision of the Supreme Court of Iowa is quoted in full, but the Court did not discuss the question in its relation to the safety of passengers in the cars, and so the Commissioners refer it again to the Governor. The Trans-Missouri Freight Association decision of the United States Supreme Court is copied in full. About 50 pages are filled with historical sketches of Iowa railroads. The volume contains a large number of full-page direct-process illustrations, from photographs, of handsome passenger stations and important bridges of the principal Iowa railroads. These illustrations are scattered throughout the book, in the tabular matter as well as elsewhere, a truly original and praiseworthy method of lightening the dreariness of dry statistics.

Keeping Passenger Cars Clean.

As Boards of Health, both state and municipal, now take an active interest in the sanitary condition of railroad cars, a railroad officer having charge of passenger train cars finds it desirable, if not necessary, to maintain strict rules and methodical practice in this department of his work, in order that he may have a definite basis to work upon in dealing with public officers. Acting on this idea Mr. Garstang, of the Cleveland, Cincinnati, Chicago & St. Louis, has lately issued a code of regulations governing the cleaning and sanitation of passenger cars at terminals, the substance of which is as follows:

1. All passenger coaches must have doors and windows opened immediately on arrival at cleaning yards, the same to remain open until departure or nightfall, except in stormy weather.
2. Seats and backs thoroughly dusted and cleaned by air where practicable; seat armrests, where finished in wood, to be washed off with solution of formaldehyde each trip of 100 miles or more.
3. Dust out or wipe off inside of car each trip of 100 miles or more. Scour inside of water-coolers once a week with hot

water. Every 30 days clean the interior of car with a weak solution of Modoc powdered soap, mixed as follows: one pound of powdered soap to 6 lbs. of water.

4. Oil lamps to be filled, trimmed and cleaned each trip of 100 miles or more. Pintch gas lamps cleaned and tips examined each trip of 100 miles or more.

5. Where floors of cars have been treated with dustless floor dressing, sweep out each trip regardless of mileage. Floor dressing to be applied every 30 days if necessity requires.

6. All saloons must be scrubbed, urinals thoroughly cleaned, and both disinfected each round trip of 100 miles or more with formaldehyde as follows: One pint of the solution placed in five gallons of clean water; agitate until a perfect mixture is assured. Spray with sprinkling can the floor, the inside of hopper, urinal and walls of saloon. Can containing solution to be kept closed when not using so as to retain full strength.

7. Clean and wipe windows with tripoli and waste for each 100 miles or more.

8. Wipe off body and trucks of car each trip of 100 miles or more, and for every 2,000 miles made, clean body of car with Modoc liquid cleaner.

9. Parlor, buffet and dining cars to be treated the same as coaches, except cleaning the carpet, which must be taken up, dusted and cleaned every second trip. Food boxes and refrigerators in buffet in dining cars to be cleaned and treated with formaldehyde once a week during the summer months.

10. Combined parlor and sleeping cars, when in use, to be treated the same as coaches and straight parlor cars, except bedding, which must be removed, thoroughly cleaned and aired each trip.

11. Private and pay cars to be thoroughly ventilated each day while in yards, by opening windows—keeping doors locked—and should not be cleaned until notice is given that they will be required for service. Food boxes and refrigerators in these cars to be treated the same as those in buffet and dining cars.

12. All extra or unassigned passenger equipment stored at terminals must be kept well ventilated and presentable at all times.

13. Sample of drinking water used in passenger equipment cars must be sent from each terminal to the Superintendent of Motive Power to be analyzed every six months, and oftener if the foreman in charge has any doubt as to its purity. Foremen must report to the Master Mechanic any and all cars requiring shop attention.

Formaldehyde, referred to in the foregoing rules, is a gas made by passing vapor of wood alcohol through a hot tube containing platinum gauze. The liquid form is simply water holding 40 per cent. of gas in solution. If stronger than 40 per cent. the solution is likely to decompose. This is a powerful disinfectant, deodorant and germicide. Very small quantities immediately deodorize and disinfect under the worst conditions. One pound of 40 per cent. formaldehyde in 5 gals. of water makes a 1 per cent. solution, which is a most efficient disinfectant. In this form it costs about five cents a gallon, and one gallon will disinfect 12 cars. It is used with an air sprayer which drives it into every corner and crevice.

Unlike carbolic acid or chloride of lime it leaves no objectionable odor. Neither the gas nor the liquid will injure fabrics, paint or varnish.

Coaches may be disinfected after cleaning by sprinkling the floor with a one per cent. solution. The dry gas, if liberated in an infected room, will penetrate the interior of bed clothes, and effect absolute disinfection. The apparatus for generating the gas is made in Indianapolis. The United States Marine Hospital service and many state Boards of Health have adopted formaldehyde as the official disinfectant.

TECHNICAL.

Manufacturing and Business.

The Welded Bond Co., of Johnstown, Pa., was incorporated at Harrisburgh on July 8, with a capital stock of \$10,000. It is proposed to make machinery for welding steel rails so as to make a continuous rail.

The plant of the Westinghouse Air Brake Co., at Wilmerding, Pa., which heretofore has been operated only four days a week, of eight hours each, is now running five days of eight hours each.

The Warren City Boiler Works Co., of Warren, O., is building a new shop 100 ft. wide x 200 ft. long, to be fitted with a traveling crane of 45 ft. span. The company is making extensive additions to its equipment and has a number of large orders on hand.

The American Steel Roofing Co., of Cincinnati, O., has increased its capital stock from \$20,000 to \$30,000. The company is reported to have a considerable number of orders on hand.

The Ellwood City Weldless Tubing Co., Ellwood, Pa.; the Greenville Tubing Co., Greenville, Pa., and the American Weldless Tube Co., Limited, Toledo, O., have all been reorganized and consolidated under the name of the American Tubes Co., Limited. H. A. Lozier is President and Manager of the new company.

The E. P. Allis Co., of Milwaukee, Wis., has sold to the Carnegie Steel Co., for its Duquesne steel works, a horizontal duplex cross-compound condensing Bessemer blowing engine, with air cylinders 76 in. diameter x 60 in. stroke. The steam cylinders are of the Reynolds-Corliss type, and are 56 and 48 in. diameter, respectively, x 60 in. stroke. The engine is designed to deliver 28,000 cubic feet of free air at a pressure of 30 lbs. per square inch.

A company to be known as Fayette R. Plumb Inc., of Philadelphia, has been incorporated to make tools for railroad and mining purposes. The capital stock of the company is \$350,000. The Directors are: F. R. Plumb,

President; Samuel Diston, John W. Grange, Chas. E. Grange and Walter T. Bradley.

The new plant of the National Tin Plate Co., which is being built at Monessen, a new town on the Monongahela River, in Pennsylvania, is nearly completed. It is expected to be put in operation about Oct. 1, employing 1,500 men.

Mr. Harrison, Manager of the Inca Mining Company, an American corporation in Peru, is on his way to New York to place orders for machinery, among which are a 120-ton ore crusher, concentrators, hydraulic pumps, ore cars, railroad track materials, etc. The home offices of this mining company are at Bradford, Pa. Several new mining companies have recently been formed in Peru with British capital, and in many cases American machinery is being considered.

Mr. R. H. Hood, Engineer and Contractor, has removed his New York office from the Havemeyer Building to the twentieth floor of the St. Paul Building, 220 Broadway.

An English syndicate will shortly start the construction of the new port of Montevideo. The undertaking will involve the expenditure of \$15,000,000. Plans and specifications for the quantity of machinery, etc., that will be required are soon to be placed with various manufacturers for estimates. The dredges will be unusually large, and those of American make are to be taken into consideration in asking for bids.

Iron and Steel.

The plant of the Pottsville (Pa.) Iron & Steel Co. has been ordered sold the last of August or the first of September, the sale to be subject to the first and second mortgages. The purchaser will be required to pay an amount in addition to the purchase price to be sufficient to cover all liabilities of receivers, which amount will be made known at the time of the sale. It is reported that a movement is on foot to reorganize the company and prevent the sale.

Mr. Frank H. Scott has been appointed Receiver of the Hudson Iron Co., of Hudson, N. Y. The company is reported to be perfectly solvent, having assets above liabilities amounting to \$25,000. The plant, however, has not been in operation for the last three years.

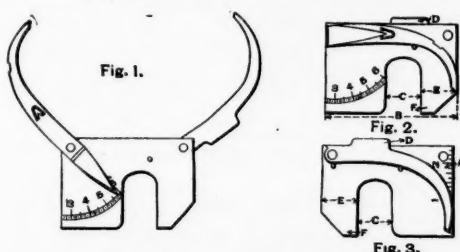
A mortgage amounting to \$43,336, held by the Lebanon National Bank against the Lebanon Rolling Mill, at Lebanon, Pa., has been foreclosed, and the plant is to be sold on July 24. The company assigned several weeks ago and an effort was made to reorganize, which, however, failed.

A meeting of the Directors of the Birmingham (Ala.) Rolling Mill Co. has been called for July 22 to authorize an increase of capital stock from \$500,000 to \$600,000, and to provide funds for doubling the capacity of the steel plant to be completed next month.

The Struthers Iron & Steel Co. purposes adding to its plant a new building 50 ft. wide x 150 ft. long which will contain a modern galvanizing works. Extensive repairs are being made to the company's furnace.

Hinckle furnace, of the Ashland (Wis.) Iron & Steel Co., has been blown out for the summer. The furnace will be repaired.

An Improved Wheel, Axle and Brake-Shoe Gage. The Youngstown Specialty Manufacturing Co., Youngstown, O., is introducing a gage designed for use by car inspectors, repair men, engine foremen and others concerned with the care of trucks. It is made of steel $\frac{1}{8}$ in. thick, and is nickel plated. It closes up closely and can be carried in a vest pocket. Fig. 1 shows the gage opened to caliper a journal in the oil box, the indicator showing at a glance the diameter of the journal. There is no necessity of removing the packing or journal bearing, even with the bearing against the collar of the axle. The $\frac{1}{4}$ -in. notch in left arm of caliper is for the ready gaging of the axle collar. Figs. 2 and 3 show



the gage with arms of caliper closed. The side marked A is scaled $2\frac{1}{2}$ in. and designed for quick gaging slid flat wheels. The length of the gage as shown by B is $3\frac{3}{4}$ in. and designed to gage a broken rim wheel. The opening C is one inch and is designed for gaging a thin flange wheel. The projection D on right arm of caliper extends $\frac{5}{8}$ in. and is designed for gaging the worn tread of a wheel. The space E is designed for the measurement of a vertical worn-flange wheel. The space F is designed for measurement of brake-shoes to determine when worn out. The gage was designed by Mr. Walter Brainard, Joint Foreman Car Inspector, Lake Shore & Michigan Southern and Pittsburgh & Lake Erie.

Track Material for China.

Information is received of the last contract that the Imperial Chinese Railroad placed at Shanghai, and which was awarded to the Société Cockerill, of Seraing, Belgium. The contract comprises 1,722 tons of rails, 1,880 tons of sleepers and 673 tons accessories. Altogether there were eight com-

petitors, as follows: The Allhusen Steel Works, Allhusen, Germany, £35,650; the Bochum Steel Works, Bochum, Germany, £32,000; Krupp, of Essen, £31,900; Acieries d'Honfleur (France), £31,025; Bolckow, Vaughan & Co., Middlesbrough, £30,875; the Dortmund Union, Dortmund, Germany, £30,350; the Angleur Steel Works, Angleur, Belgium, £29,250, and the Cockerill Company, £28,750.

The Compound on the Chesapeake & Ohio.

At the Master Mechanics' Convention, Mr. W. S. Morris, Supt. Motive Power, C. & O., made some statements with regard to the results from compound and simple locomotives in freight service on that road. His remarks were very badly reported. The following is a correct copy of the report from which he spoke:

Coal Performance of G-5 Engines for Twelve Months Ending January 31, 1897, Compared with G-3 Engines for the Same Period of Previous Year.

Engine mileage.	Tons coal.	Freight car mileage.	Miles to ton.		Lbs to mile		Cars per eng. mile.	Tons h'd per eng m	Lbs. coal ton mile.
			Eng.	Cars.	Engs.	Cars.			
			G-3's, simple.						
119,000	7,667	1,601,055	15.52	208.82	128.86	9.58	13.45	502	257
			G-5's, comp.						
120,543	8,456	2,105,658	14.24	249 01	140.30	8.03	17.47	652	215

In pounds of coal consumed per car mile the G-5's show 16.2 per cent. less.

In cars per engine mile the G-5's show 29.9 per cent. more.

In tons hauled per engine mile the G-5's show 29.9 per cent. more.

In pounds of coal consumed per ton mile the G-5's show 16.2 per cent. less.

The G-5's made 8.2 per cent. less engine miles to ton of coal and hauled 29.9 per cent. more cars per train. The numbers of the G-3 engines are: 238, 242, 247, 252 and 253; the numbers of the G-5 engines are, 351, 352, 353, 354 and 355. The engineers running these engines are practically the same for both years. The weight per car is computed at an average of 37.3 tons. Mr. Morris adds: "We expected that these engines would haul a greater tonnage, because they are heavier and carried more steam, but the fuel economy that they show is entirely due to the compound feature, which in pounds of coal consumed shows 16.2 per cent. less per ton per mile hauled."

THE SCRAP HEAP.

Notes.

Brown's discipline is to be adopted on the Atchison, Topeka & Santa Fe Aug. 1.

The Massachusetts Railroad Commissioners, on Tuesday last, considered the Sunday steamboat question and granted the petition of the Providence, Fall River & Newport Company to run one Sunday steamboat, each way, between Fall River, Newport and Block Island.

The Boston & Albany has completed and put in use two main tracks on the new depressed grade between Faneuil and Auburndale, Mass., five miles. This important improvement was begun about one year ago, and the widening of the cut for the third and fourth main tracks is now being rapidly carried out.

On July 11 the 40-ton flywheel of a Corliss compound engine in the power-house of the Tacoma Railway & Motor Co., Tacoma, Wash., burst, demolishing the two-story brick building and injuring several people, but none seriously. The accident is said to have been due to the breaking of the connection with the governor.

The Pittsburgh, Cincinnati, Chicago & St. Louis, which, in several cities, has paid its freight-house-men by the piece for a year or two past, made arrangements to introduce that plan at the North Halsted street freight-house in Chicago last week, but the men struck, claiming that the new rates (by the ton) would work a hardship upon them.

The warehouse of the Chicago & Alton, between Van Buren and Harrison streets, Chicago, was burned down July 8, loss, including damage to merchandise and to 40 loaded freight cars, \$20,000. The general storehouse of the Lehigh Valley Railroad at Hazleton, Pa., was burned on July 9, the fire starting in the paint department. The building was entirely destroyed, the loss being estimated at about \$100,000.

Severe rain storms and tornadoes prevailed in various parts of Minnesota on July 7, and in the vicinity of Duluth at least 14 persons were reported killed. On the Great Northern Railway, near St. Cloud, a long freight train was wrecked and several men were killed. On the Chicago, Milwaukee & St. Paul, near Faribault, on the same day, a freight train was wrecked and two men killed, and a short time afterward a wrecking train was itched.

Bids were opened by the New York Dock Department on Monday for the first of the five new piers that are to be built for the Cunard, White Star and Wilson lines. This pier will be located at the foot of West Eleventh street and has been leased by the White Star Line. There were 11 bids submitted, ranging from \$69,900 to \$94,400, while the estimated cost by the Chief Engineer of the Dock Department was \$88,800. The lowest bid was that of Grannan & Jennings.

Railroad Disaster in Denmark.

A press dispatch from Copenhagen, July 12, reports a terrible disaster at Gjentofte. The express from Beltinger ran into a passenger train standing at the station, about midnight, wrecked eight carriages, killed about 40 persons and injured many others. Most of the victims are of the artisan class.

Pleasures of the "Trolley" in Chicago.

CHICAGO, July 9.—Three highwaymen armed with revolvers stopped a trolley car on the Cicero & Proviso line last night, and robbed the conductor, motorman and the passengers of their watches and money. They secured several silver watches, three gold watches and about \$100 in money. They escaped without being pursued. The robbery took place just outside of the city limits. An hour after, in Cicero, five highwaymen boarded an Archer avenue electric car, at Thirty-eighth street and Kedzie avenue, and, after covering the motorman and conductor with revolvers, secured \$60, a watch and a revolver. The robbers all wore masks, and did their work so quickly that after they had disappeared the motorman and conductor were unable to give a description of them. Twenty detectives were on the scene within 15 minutes, but no arrests were made.—Press despatch.

CHICAGO, July 11.—Five masked men, armed with revolvers, held up an eastbound Twelfth street trolley car on the viaduct west of the river at a late hour last night, secured two silver watches, and about \$30 in cash, besides a certificate of deposit for \$100 and a note for \$557, and made their escape south in the Lumber street viaduct.

Baltimore & Ohio Improvements.

The double track of the Baltimore & Ohio at the point known as Seven Curves, work on which has been going on for the past eight months, was opened to traffic July 4. A description of this work, with a map of the old and new lines of track, was given in the *Railroad Gazette* of Dec. 25, 1896, page 896. A number of deep cuts were necessary at this point and it is reported that the cost of the work approximated \$100,000.

The Canadian Steamship Line.

A Montreal dispatch of July 9 states that Peterson & Tait, the contractors who are to build the steamships for the proposed fast subsidized mail line to run between Canada and England have secured subscriptions from leading capitalists for all of the \$10,000,000 needed to establish the line. Sir Blundell Maple has subscribed for \$2,500,000.

The Philadelphia Subway.

The cost of the extensive improvement of the Philadelphia & Reading in Pennsylvania avenue, Philadelphia, is to be considerably reduced by the abandonment of the very costly elevator which it was expected would have to be put in to make a track connection with the works of William Sellers & Co. It will be remembered that in the original plans for the subway it was designed to build, at the shops of the firm named, a lift, to raise from the new depressed grade to the old or street grade a locomotive and three cars. At the time the plans were made this was the only feasible way of making the desired connection, but since then the Reading has been able to purchase, at a lower price than could have been had before, a large piece of land by which a direct rail connection can be made with the Sellers works, and without a bad grade.

A Six-Decker.

A Chicago paper reports that the owners of the whale-back Christopher Columbus, are making arrangements to construct a duplicate of that boat. It is to be called the America, and is to be run between Chicago and Milwaukee, while the Columbus, after some alterations are made in her hull, will be run between Chicago and St. Joseph. The America will cost \$500,000 and be a six-decker. The Columbus has only five decks. The passenger capacity of the Columbus is 5,000; that of the America will be 6,000.

A Submarine Torpedo Boat Company.

The John P. Holland Torpedo Boat Co., of New York, on July 18, filed with the Secretary of State at Albany, a certificate of an increase of its capital from \$500,000 to \$600,000 and an increase in the number of its directors from five to seven.

Contracts for New Torpedo Boats.

Secretary Long will accept the recommendations of the Board of Naval Bureau Chiefs as to the award of contracts for three torpedo boats. In this case the contracts will go to the Harlan & Hollingsworth Co., Wilmington, Del., the Morris Heights Gas & Engine Co., New York, and Wolff & Zwicker, Seattle, Wash.

Trial of the Torpedo Boat Dupont.

During a trial in Narragansett Bay, the torpedo boat Dupont, on July 7, made a speed of 30.83 knots with a boiler pressure of 235 lbs., the revolutions of her engines being 420 a minute.

The Monongahela Navigation.

The Monongahela River improvements are now the property of the United States government, and are henceforward free from tolls. On July 7 Assistant Secretary of War George D. Meikeljohn handed the Monongahela Navigation Company a warrant for \$3,601,615.46. Major Powell, who will have charge of the locks for the government, sent notices to all the lockkeepers that they would be retained temporarily.

Flour to China and Japan.

The total shipments of wheat flour from the United States to Japan and China during the 10 years ended June 30, 1896, amounted to 6,000,000 bbls., and by far the larger part of this quantity was exported in the latter half of the decade. The amount exported during the fiscal year 1887, the opening year of the decade, was returned at 409,147 bbls. In 1896, 10 years later, our shipments reached as high as 943,073 bbls. Still further gains are indicated by the figures thus far available for the current fiscal year. According to these figures our total shipments to Japanese and Chinese ports during the nine months ended March 31, 1897, amounted to 882,204 bbls. Of the American flour sent across the Pacific the major portion goes to Hongkong and is thence largely distributed to other ports in China. Although our exports of flour to Japan are considerably smaller than those to Hongkong and China, they show an increase during the last few years that is proportionately even greater, having advanced from 30,377 bbls. in the fiscal year 1887 to 103,582 bbls. in the fiscal year 1896. The growth in this export trade, which was particularly rapid during the last two or three years, continues to an even greater degree in the present fiscal year, our exports to Japan during the six months ended Dec. 31 reaching no less a figure than 151,349 bbls., or more than was ever before exported in an entire year. According

to the returns for the nine months ended March 31, placing the shipments for that period at 171,134 bbls., it may be estimated that the total exports of wheat flour from this country to Japan during the year ending June 30, 1897, will amount to about 200,000 bbls. These figures are from the Department of Agriculture, Section of Foreign Markets.

Receiverships and Foreclosures During 1897.

The following lists of receivership appointments and foreclosure sales have been compiled by the *Railway Age*:

RECEIVERSHIPS APPOINTED FROM JAN. 1 TO JULY 1, 1897.

Roads.	Miles.	Bonded debt.	Capital stock.
Mississippi & Little Rock.....	27	\$533,000	\$1,000,000
Greenwood, Anderson & West-ern	66	1,200,000	540,000
Salem Railroad.....	7	125,000	
Columbus, Sandusky & Hock-ing	226	9,550,000	7,389,000
Wheeling & Lake Erie.....	247	7,682,000	14,500,000
St. Clair, Madison & St. Louis Belt	2	600,000	500,000
Metropolitan West Side Ele-vated (Chicago).....	18	12,000,000	30,000,000
Sharpsville Railroad.....	30	135,000	350,000
Vancouver, Klickitat & Ya-kima.....	12	760,000	760,000
Henderson & Brevard.....	22	150,000	197,000
Columbus, Hocking Valley & Toledo	323	17,604,000	14,196,000
Gainesville, Jefferson & South-ern (3 ft.).....	65	713,000	200,000
Wilmington, Newbern & Nor-folk	87	1,150,000	1,200,000
Indian Springs & Florville.....	3	12,000	25,000
Allegheny & Kinzua.....	41	285,000	500,000
Brooklyn Elevated.....	17	12,988,000	13,283,000
Northwestern of Georgia.....	39	260,000	230,000
Harriman & Northeastern (3 ft.)	30	290,000	600,000
Centralia & Chester.....	62	792,000	792,000
Total 19 roads.....	1,314	\$66,029,000	\$85,622,000
Total bonds and stock.....			151,651,000

* Partly estimated.

RAILROADS SOLD UNDER FORECLOSURE FROM JAN. 1 TO JULY 1, 1897.

Roads.	Miles.	Funded debt.	Capital stock.
Kentucky Midland.....	40	\$962,000	\$510,000
Cincinnati, Jackson & Mack-inaw	323	4,234,000	16,000,000
Oregon Short Line & Utah Northern	1,428	49,832,000	26,244,000
Chattanooga, Rome & Colum-bus	140	3,600,000	2,800,000
Cœur d'Alene Railway & Navi-gation Co. (3 ft.).....	25	1,238,000	1,000,000
Natchez, Red River & Texas (3 ft.).....	25	300,000	485,000
Altoona, Clearfield & Northern (3 ft.).....	13	149,000	44,000
Texas, Sabine Valley & North-western	38	604,000	475,000
Cuyler & Woodburn.....	14	26,000	14,000
Louisville, New Albany & Chi-cago	511	13,500,000	15,250,000
St. Louis, Salem & Arkansas.....	54	810,000	1,100,000
Evansville & Richmond.....	101	1,400,000	1,500,000
Owensboro, Falls of Rough & Green River	42	743,000	754,000
St. Louis, Chicago & St. Paul.....	110	1,250,000	2,000,000
Quincy, Omaha & Kansas City.....	135	1,750,000	2,000,000
Atlantic & Pacific.....	564	39,800,000	79,700,000
Middle Tennessee & Alabama.....	32	710,000	450,000
Utah Central (3 ft.).....	44	220,000	360,000
Seaboard Railway.....	26	216,000	500,000
Middle & East Tennessee Cen-tral	12	125,000	22,000
Short Route Railway Transfer Co.	2	500,000	500,000
Kansas Central.....	165	1,346,000	1,348,000
Kansas City & Southeastern.....	10	100,000	100,000
National City & Otay.....	28	451,000	474,000
Total 24 roads.....	3,882	\$123,886,000	\$153,630,000
Total bonds and stock.....			277,516,000

* Partly estimated.

The total bonds and stock of the roads sold under foreclosure during 1896 was \$1,150,377,000, and during 1895, \$761,791,000.

Civil Engineers in the Navy.

As a result of a competitive examination the President has selected for nomination and appointment to the position of civil engineer in the navy Frank P. Chambers, of Louisville, Ky., and Charles Weimann Parks, of New York, both graduates of the Rensselaer Polytechnic School of Troy. The examination was to fill a vacancy, but as the men came out evenly in first place in a competition including 17 applicants, and the Civil Engineer Corps is in need of an increase, the President decided to appoint the two leaders.

Information for the Germans.

A recent issue of Glaser's *Annalen* contained a very comprehensive paper on the construction of steel bridges and modern high buildings. Illustrations and descriptions were given of the Forth bridge, a suspension bridge at Frankfurt-on-Main, a bridge at Loschwitz, on the Elbe, and three designs for the proposed Hudson River bridge at New York. In treating of high business buildings in New York, descriptions are given of the various stages of construction, from the foundations up; and to those Europeans who have never been in the United States, the article must have been a revelation.

The Jersey Central's Proposed New Ferry Line.

The Central Railroad of New Jersey has announced that it will shortly begin operating a new ferry line between its Communipaw (Jersey City) station and some point at or near South Ferry, New York City, probably at the foot of Whitehall street. The company has had the project in view for a number of years. There will be no change in the company's present ferry line between Communipaw and Liberty street.

Extra Hard Steel.

The *Engineer* (London) publishes the following letter from Mr. Hiram Maxim: "Some months ago Mr. Samuel Maxim, who is a farmer in Wayne, Me., where the Maxim family has lived during the last 110 years, commenced certain experiments with a view of ascertaining how much truth there was in the statement that one often finds in ancient literature relating to the remarkable strength and hardness of Hindoo and Japanese

steels. It seems that his experiments were crowned with success, for he wrote me a bantering letter telling me what he had done, and challenging me to send to him the hardest piece of steel I could find in England, and he would drill a hole through it, tie a blue ribbon through it, and allow me to wear it as a decoration. I wrote back to him stating that we had many kinds of hard steel in England, and perhaps, after all, his steel was no harder than some well-known grades. In reply to this he sent me some specimens which he had drilled. One of these specimens was considerably harder—in fact, it was the hardest specimen of steel that he could find. About that time it seems that an American newspaper reporter heard of the steel, and wrote up a very elaborate and sensational article. When this appeared my brother was very much disgusted, as the article gave him a lot of trouble; people also commenced to write to me on the subject. It was then that I wrote a letter to a well-known engineering journal, stating all I knew of the subject, thinking thereby to explain matters and so help me out. However, a certain thin-skinned individual at Sheffield evidently regarded my letter as an attack upon English steel, and he was up in arms in a minute. Then I was made the butt of some abusive letters and ridiculous criticisms. At the present moment I have been interviewed right and left regarding this steel. The more I say about it and the more I try to impress upon my interviewers that I do not have any steel for sale, the more they say about it, and my trouble is correspondingly increased. The facts of the case are simply these: Samuel Maxim has succeeded in making occasionally, not always, small slugs of steel which can be forged into drills, and which appear to me to be considerably harder than any steel that I have heretofore known. Whereas Vicker's extra special steel, Mushet's steel and some grades of French steels may be made into drills which will go through a ½-in. file by being ground once, Samuel Maxim's steel will drill several holes without any apparent dulling of the drill. This is all I know about the much vexed question. The fact is, however, that the plain unvarnished truth is not sensational enough for some newspaper reporters. They exaggerate the facts until the whole thing appears ridiculous in the extreme."

Amenities of Railroadings.

Mr. W. A. Hart, Divisional Superintendent, Great Western Railway, has been the recipient of another diamond scarfpin. Last week I recorded the fact that the Prince of Wales had presented Mr. Hart with a scarfpin, and now I have to announce a similar present—a ruby and diamond pin—from the Prince of Bulgaria. The scarfpin is adorned with the Prince's monogram in brilliants and surrounded by a golden crown, and has been presented to Mr. Hart in recognition of the latter gentleman's attention to the Prince while traveling between London and Windsor.—*Transport*.

The North Sea Canal.

The great North Sea "Emperor William Canal" during the fiscal year ending March 31, 1897, passed 19,960 vessels paying tolls, with an aggregate of 1,848,458 registered tons, of which four-fifths of the tonnage was laden, the remainder in ballast. Of the whole number 8,287 were steamers, with 1,405,435 register tons, and 3,144 of these, with 351,139 register tons, belonged to regular lines. Only 32 steamers passing were of more than 1,500 tons burden, 75 from 1,000 to 1,500, and 383 more than 600 tons. Of the sailing vessels only 13 registered over 400 tons and 693 more than 100 tons. The tolls collected amounted to \$232,816, and there was other revenue, chiefly for tonnage, amounting to \$19,097, so that as a money-making enterprise it is not a success. Its object was chiefly strategic, however.

LOCOMOTIVE BUILDING.

The Northern Pacific has given an order to the Schenectady Locomotive works, Schenectady, N. Y., for 10 locomotives.

The Texas & Pacific has given an order to the Baldwin Locomotive Works for six locomotives. They will be equipped with the Houston Sand Box.

The Richmond Locomotive Works, of Richmond, Va., has received an order for two locomotives from the Southern Railway.

Subject to the order of the Court, the following term have been agreed upon between the Receivers of the Baltimore & Ohio, and Burnham, Williams & Co., and the Pittsburgh Locomotive Works, for the road's proposed new equipment: Burnham, Williams & Co., to supply five passenger and 20 freight locomotives for \$280,000 to be paid in five equal installments; Pittsburgh Locomotive Works to supply 15 locomotives at \$11,370 each, payments to be made in five equal installments.

The Baldwin Locomotive Works are building two consolidation locomotives for the Columbia & Puget Sound Railroad, which are to be fitted with Westinghouse-American air-brakes on all driving and tender wheels, Westinghouse 9½-in. air pumps, Nathan Lu-ricators, monitor injectors, Utica headlights and magnesia sectional boiler lagging. The general dimensions are as follows: Cylinders, 19 in. x 24 in.; driving wheels 50 in. diam.; boiler, straight top, 58 in. diam.; firebox 103 in. long by 33½ in. wide; tubes, 183 in. number, 2½ in. diam. and 13 ft. 3 in. long; total wheel base, 21 ft. 4 in.; driving-wheel base, 13 ft. 8 in.; weight in working order, total, about 115,000 lbs.; weight on drivers, about 100,000 lbs.; capacity tank, 3,500 gals.

CAR BUILDING.

The Texas & Pacific is in the market for 300 box cars. The Louisville & Nashville is in the market for 400 box cars.

The Lexington & Eastern has ordered one passenger car from the Ohio Falls Car Co.

The New Orleans & Northeastern has ordered seven freight cars from the Elliott Car Co.

The Kansas City, Pittsburgh & Gulf has given an order to the Pullman Car Co. for 200 freight cars.

The Middletown Car Works has received an order for three freight cars from the H. J. Heintz Co.

The International & Great Northern is in the market for 150 box cars of 60,000 tons capacity. Leroy Trice is General Superintendent.

The Pennsylvania Company is completing 200 gondola cars at its Fort Wayne shops. It is proposed to begin work on 100 more gondola cars within a few days. The company also proposes building 200 box cars shortly.

The Terre Haute Car & Mfg. Co. has received an additional order from the Live Poultry Transportation Co. for 63 freight cars, suitable for shipping live poultry. Westinghouse air-brakes will be used on these cars the same as on the 37 cars, the order for which was recently noted in these columns.

The Florence & Cripple Creek has recently received eight passenger cars and three baggage cars from the St. Charles Car Co., St. Charles, Mo. The passenger cars are finished in mahogany and are fitted with Bushnell plush seats. Heretofore old narrow-gauge equipment of the Denver & Rio Grande has been leased by the company.

The Pittsburgh & Lake Erie Railroad has recently received from the Youngstown Bridge Co. a steel car built to the drawings and specifications of the railroad company. The total length is 32 ft. over the couplers, the total width 9 ft. 4 in., total height 9 ft. 1 in., capacity 80,000 lbs.; light weight, 35,600 lbs., equipped with King hopper door.

Subject to the order of the Court, the following terms have been agreed upon between the Receivers of the Baltimore & Ohio and certain car companies, for the road's proposed new equipment: The Pullman Palace Car Co., to supply 8,000 box cars for \$1,557,000, payable in 10 equal installments; the Michigan Peninsular Car Co., to supply 500 gondola cars for \$250,000 in payments at 12, 15, 18 and 24 months; the South Baltimore Car Works to supply 250 coal cars for \$127,000 and \$89,500, to be paid on lease warrants.

BRIDGE BUILDING.

Askaloosa, Ia.—Bids are asked Aug. 19 for an iron bridge over South Skunk River, between Keokuk and Mahaska counties. J. B. Cruzen, County Auditor.

Albany, N. Y.—Bids for the superstructure of the Knox street viaduct were received July 6, as follows: Buffalo Bridge Co., \$15,910; Edge Moor Bridge Works, \$17,961; Groton Bridge Manufacturing Co., \$18,500; Hilton Bridge Works, \$14,700; King Bridge Co., \$18,766; Wrought Iron Bridge Co., \$18,335. Bids for the masonry substructure were: W. L. McDonough, Utica, N. Y., \$12,389; Frank Pidgeon, Saugerties, N. Y., \$14,175; Wayland & Higgins, Whitehall, N. Y., \$10,310.

Bridgeport, Ky.—The wooden county bridge crossing the Benson at this place has been burned.

Buzzard's Bay, Mass.—The Secretary of War has approved the plans for a bridge across Monument River, on the new Shore road.

Catawissa, Pa.—The Board of Public Grounds and Buildings has awarded the contract for the bridge over the Susquehanna River at this point to the Penn Bridge Co., Beaver Falls, at its bid of \$81,400.

Cobourg, Ont.—Tenders are asked for the iron work of a bridge at Campbellford. Plans can be seen at the office of Neil MacNachtan, County Clerk, or the County Engineer, H. T. Hazen.

Friendsville, Md.—The County Commissioners have awarded the contract for the new 155-ft. iron bridge over the Youghiogheny River, at this place, to the Wrought Iron Bridge Co. at \$2,050.

Guelph, Ont.—J. Hutcheon, C. E., is preparing plans for a steel bridge over the Grand River, at Belwood, West Garafraxa.

Hackensack, N. J.—A committee has been appointed by the Board of Chosen Freeholders to procure plans and specifications and ascertain the probable cost of a bridge over the Hackensack River at Anderson street. The Board has agreed to build a bridge at Westwood and also one at Closter.

Madison, Ga.—Bids are asked July 30 for a 300-ft. iron bridge over the Appalachian River at Head's Hill. B. G. Walker is interested.

Milwaukee, Wis.—The Committee on Highways and Bridges will have plans made and advertise for bids for an 80-ft. steel and iron bridge not to cost over \$3,000.

Orangeville, O.—The Commissioners of Mercer and Trumbull counties have received bids for the 100-ft. bridge, at this place, ranging from \$2,780 to \$3,140 for a structure with a sidewalk, and from \$2,295 to \$2,458 without a sidewalk, the Youngstown Bridge Co. being the lowest bidder.

Orillia, Ont.—A new steel bridge will be built between Tray and Baxter, to replace the one recently washed away.

West Chester, Pa.—Seven bridges along Brandywine Creek are reported to have been washed away by the heavy rains.

Worcester, Mass.—It is understood that the State Harbor and Land Commissioners will issue a license for the new Lake Quinsigamond bridge as soon as the city has complied with certain minor requirements. The bridge will have an arch of 40 ft. at either end and a middle arch of 70 ft.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Burlington, Cedar Rapids & Northern, 2 per cent., payable Aug. 2.

Central of New Jersey, quarterly, 1 per cent., payable Aug. 2.

Mine Hill & Schuylkill Haven, 3 per cent., payable July 15.

New Orleans & Lake, 4 per cent., payable July 10.

Rio Grand Western, 4 per cent. on preferred stock, payable Aug. 16.

Brooklyn City, quarterly, 2½ per cent., payable July 15.

Coney Island & Brooklyn, quarterly, 1½ per cent., payable July 1.

Crescent City (New Orleans), 3 per cent., payable July 10.

Hartford (Conn.) Street, 3 per cent., payable July 1.

Holyoke (Mass.) Street, 4 per cent., payable July 1.

Kings County Traction (Brooklyn), 1 per cent., payable July 26.

New Orleans City & Lake, 4 per cent., payable July 10.

Northampton (Mass.) Street, 4 per cent., payable July 1.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The American Society of Railroad Superintendents.

will hold its next meeting at Nashville, Tenn., beginning Sept. 22.

The *American Street Railway Association* will hold its sixteenth annual convention in Convention Hall, Niagara Falls, Oct. 19-23, 1897.

The *Boston Society of Civil Engineers* meets at 715 Tremont Temple, Boston, on the third Wednesday in each month, at 7:30 p. m.

The *Canadian Society of Civil Engineers* meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday, at 8 p. m.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

The *Civil Engineers' Club of Cleveland* meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month, at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

The *Engineering Association of the South* meets on the second Thursday in each month, at 8 p. m. The Association headquarters are at The Cumberland Publishing House, Nashville, Tenn.

The *Engineers' and Architects' Association of Southern California* meets each third Wednesday of the month in the Hall of the Chamber of Commerce, Los Angeles, Cal.

The *Engineers' and Architects' Club of Louisville* meets in the Norton Building, Fourth avenue and Jefferson street, on the second Thursday each month at 8 p. m.

The *Engineers' Club of Cincinnati* meets at the rooms of the Literary Club, No. 25 East Eighth street, Cincinnati, O., on the third Thursday in each month, at 7:30 p. m. Address P. O. Box 333.

The *Engineers' Club of Minneapolis* meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The *Engineers' Society of Western Pennsylvania* meets at 410 Penn avenue, Pittsburgh, Pa., on the third Tuesday in each month, at 7:30 p. m.

The *Montana Society of Civil Engineers* meets at Helena, Mont., on the third Saturday in each month, at 7:30 p. m.

The *North-West Railway Club* meets on the first Tuesday after the second Monday in each month, at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2:30 p. m.

The *Railway Signalling Club* will meet on the second Tuesday of the months of January, March, May, September and November, in Chicago.

The *St. Louis Railway Club* holds its regular meeting on the second Friday of each month, at 3 p. m.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Technical Society of the Pacific Coast* meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

The *Western Foundrymen's Association* meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. A. Sorge, Jr., 1533 Marquette Building, Chicago, is secretary.

The *Western Railway Club* meets in Chicago on the third Tuesday of each month, at 2 p. m.

The *Western Society of Engineers* meets in its rooms on the first Wednesday of each month, at 8 p. m., to hear reports, and for the reading and discussion of papers. The headquarters of the Society are at 1736-739 Monadnock Block, Chicago.

Western Society of Engineers.

The next meeting of the Western Society of Engineers will be held Wednesday evening, July 21, in the society rooms, Monadnock Block, Chicago. Mr. F. G. Gassche, Mechanical Engineer of the South Works of the Illinois Steel Company, will present a paper, "Causes of Variable Efficiency of Steam Boilers and Their Influence on Tests."

American Railway League.

This is the name of an organization formed at Columbus, O., on July 7. The President of the "Grand Lodge" is R. S. Kayler, State Railroad Commissioner of Ohio. One of the trustees is Joseph Flory, State Railroad Commissioner of Missouri. A press dispatch says that the object of the League is to organize the railroad men of the country to vote against candidates for office "who are known to be hostile to railroad interests." B. B. Ray, Secretary of the Illinois Railroad & Warehouse Commission, is one of the Vice-Presidents of the League.

American Institute Fair.

The next annual industrial and agricultural fair of the American Institute, to be held at Madison Square Garden, New York City, from Sept. 20 to Nov. 4, will have a new department, to be known as the Department of Intercommunication. This will include old and new methods of rail and water transportation and railroad building and working, to be shown by models. Motor carriages, telegraphs, telephones and numerous other articles pertaining to transportation will also be included in the department. Several medals and diplomas will be awarded to competitors. Charles Gulden and S. McCormick are the committee in charge of the Department of Intercommunication. The officers of the Board of Managers of the 1897 Fair are Dr. P. H. Murphy, Chairman; Oliver Barratt, Vice-Chairman; Alfred Chasseaud, General Superintendent; George Whitefield, Jr., Secretary, and Allen S. Williams, Chief of the Press Bureau.

Engineers' Club of Cincinnati.

At the June meeting of the club Mr. R. L. Engle described the manner of building the concrete piers for the highway bridge under construction by the authorities of Pulaski County across the Arkansas River at Little Rock, Ark. The bodies of these piers were made of concrete composed of one part cement, three parts sand and six parts broken stone not larger than 2½ in. Exposed surfaces had a coating of mortar 2 in. thick composed of one cement and two sand, which was put in place while the formers were still up, thus leaving the surfaces comparatively smooth and free from any showing stones. The cement used was principally alborg from Denmark, with some Alsen and some American Portland. Sand from the bars of the Arkansas River was found on experiment to be superior for the purpose to crushed quartz, which had been specified and was used to a considerable extent in the work. Specimens prepared of one cement and three sand never fell below a tensile strength of 140 lbs. The concrete was placed in position in 9 in. layers, leveled off and slightly rammed. Following the usual custom of the club, no meetings will be held in July and August, the next meeting being on Sept. 16.

Iron and Steel Institute (British).

In accordance with the announcement in our issue of June 25, the autumn meeting of the Iron and Steel Institute will be held at Cardiff, on August 3, 4, 5 and 6 next. The following papers have been offered for reading:

"Passive Iron." By J. S. de Benneville (Philadelphia).

"The Diffusion of Sulphides Through Steel." By E. D. Campbell (Ann Arbor, Mich.).

"The Manufacture of Tin Plates." By George B. Hammond (Penarth).

"A Spectroscopic Analysis of Iron Ores." By Prof. W. N. Hartley, F. R. S., and Hugh Ramage, Assoc. R. C. Sc. I., F. I. C. (Royal College of Science, Dublin).

"Improvements in Shipping Appliances in the Bristol Channel." By Sir W. T. Lewis, Bart., Member of Council.

"The Iron Industry of Hungary." By D. A. Louis, F. I. C. (London).

"A Thermo-Chemical Study of the Refining of Iron." By Prof. Honore Ponthiere (Louvain).

"Carbon and Iron." By E. H. Santer (Wigan).

"Some Mechanical Appliances at Penarth Docks." By T. Hurry Riches, M. Inst. C. E. (Cardiff).

"The Application of Traveling Belts to the Shipment of Coal." By Thomas Wrightson, M. Inst. C. E. (Thornaby-on-Tees).

The American Society for the Advancement of Science

The American Society for the Advancement of Science will hold its forth-sixth annual meeting at Detroit Aug. 9-13. This meeting will be followed a week later by that of the British Association at Toronto, and it is expected that many members of the British Association will attend the Detroit meeting, and that members of the American Association will go to Toronto. Twenty-two years ago the association met at Detroit under the presidency of Julius E. Hilgard, that being the first meeting after the incorporation of the association and after its division into sections, of which at that time there were only two; now there are nine. Those two divisions were: (A) mathematics, physics and chemistry and (B) natural history. The local committee for the meeting of this year includes many of the most prominent men in Michigan, the Governor, several ex-Governors, the United States Senators, several bishops, college presidents and professors. A number of affiliated societies will meet with the sections of the Association. Professor Oliver Wolcott Gibbs is President-elect of the Association. He is now 75 years old. He was graduated from Columbia at the age of 19 and from the College of Physicians and Surgeons at 23, and he continued his education by special studies at various European universities and colleges. From 1849 to 1863 he was Professor of Physics and Chemistry at the College of the City of New York. He was then elected Rumford Professor at Harvard and put in charge of the laboratory of the Lawrence Scientific School. He remained at Harvard until he was retired from active work and is now Professor Emeritus and the Senior of the Harvard faculty. In the war he was active in organizing the United States Sanitary Commission and in work with that Commission.

American Society of Civil Engineers.

At the convention held in Quebec, the following nominating committee was elected: District No. 1, Henry B. Seaman, New York City; No. 2, E. K. Keating, Toronto, Ont.; No. 3, E. W. Howe, Boston; No. 4, John N. Chester, Pittsburgh; No. 5, Gouverneur Morris, Detroit; No. 6, James Dun, Topeka; No. 7, A. W. Scott, Charleston, W. Va.

The proposed amendment fixing the status of past Presidents in the Board of Direction as finally adopted to go out to letter ballot is as follows: The officers of the society shall be a President, four Vice-Presidents, 18 Directors, a Secretary and a Treasurer, who, with the five latest living Past Presidents, who shall continue to be members of the society, shall constitute the Board of Direction, in which the government of the society shall be vested, and who shall be the trustees, as provided for by laws under which the society is organized. For the election of honorary members all the Past Presidents shall be members of the Board of Direction, except any Past President who may be disqualified by mental or or bodily infirmity, and the evidence of such disqualification of any Past President shall be a certificate from his attending physician or an officer of the society.

The Collingwood prize (for Juniors) for the year 1896, was awarded to Mr. H. W. York (now a Member) for his paper on "The Twenty-Eighth Street Central Station of the Edison Electric Light Co., New York."

It was announced that Sir Benjamin Baker, of London, and Professor George Davidson, of San Francisco, has been elected honorary members of the society.

It was announced from the Board that the following committee had been appointed to report on the proper manipulation of tests of cement: Prof. George F. Swain, Messrs. Alfred Noble, George S. Webster, W. B. W. Howe, Louis C. Sabin and H. W. York and Capt. O. M. Carter, Corps of Engineers, U. S. A.

Conference of the International Association for Testing Material.

The announcement and programme for the above conference have just been received. The proceedings will be as follows:

Thursday, Aug. 23.—Opening of the Congress by the President; words of welcome by the President of the Swedish Local Committee; constitution of the bureaux for all the sessions; report by the President on the activity of the Council and Executive Committee during the period elapsed since the Zurich conference in 1895; address by Prof. C. A. Delwik, Director of, and Prof. Wahlberg, Chief of the Metallurgical Laboratories at Stockholm, on "The Development of Interests of Structural Materials in Sweden and Methods of Testing Same"; address by Mr. F. Osmond, C. E., Paris, on "Micrometallurgy as a Method of Testing," illustrated by lantern; after recess, visit to exposition at 4 p. m.

Friday, Aug. 24.—Report on "Research on Ways and Means to Introduce International Methods of Determining Quality of Testing and of Inspection of all Steels and Irons"; report by M. Polonceau, C. E., Paris, on "The Exact State of the Various Propositions for Unification of Methods of Testing Materials"; report by Dr. Wedding, Berlin, on "The Precise State of the Question of an International Central Sidero-Chemical Laboratory."

In the afternoon of the same day these will be deliberations of the various sections. First group, "Metals"; second group, "National Artificial Stones and Bond Materials"; third group, "All Other Materials." Discussions on papers and reports presented, of problems submitted and prepared for the Stockholm Conference. Preparation of programme of question to be discussed at the Paris Conference in 1900.

Saturday, Aug. 25.—Reports on the "Deliberations of the Sections"; discussions on the "Proposed Revised Statutes"; nomination of the Executive Committee.

In afternoon of the same day there will be an excursion on the lake to "Saltsjbaden," and the final banquet.

This Stockholm Conference is in continuation of the well-known "Bauschinger Conferences" on a much wider and larger scale, so as to include all nationalities and countries. The International Association had over 1,200 members on Jan. 1, 1897, representing no less than 20 countries, and is constantly growing. Many governments, including the United States, will be represented. Capt. O. M. Carter, U. S. A., Corps of Engineers, who also attended the Zurich Conference, has again been detailed on behalf of the War Department to attend the Stockholm Conference. Mr. Gus C. Henning, Member Council, Am. Soc. M. E., will attend as a delegate of that society, having previously attended the conferences at Vienna and Stockholm in a similar capacity. It is expected that the U. S. Navy Department will also detail an officer to attend officially. The deliberations of these conferences are of such great importance that our government has had all of the resolutions as well as the reports on cements printed at public expense. The next conference will be held in Paris during the summer of 1900, at the time of the exposition.

PERSONAL.

—Mr. H. N. Butterfield, Passenger Agent for the Atchison, Topeka & Santa Fe, at Milwaukee, Wis., has resigned to enter other business.

—Mr. W. S. Thomson has been appointed Western Passenger Agent of the Georgia, Southern & Florida, with headquarters at Indianapolis, Ind.

—Mr. George M. Vose has been appointed Superintendent of the Franklin & Megantic, with headquarters at Kingfield, Me., to succeed Mr. F. S. Mead.

—Mr. O. S. Doolittle has been appointed Superintendent of the Gettysburg & Harrisburg, with headquarters at Reading, Pa., to succeed Mr. A. M. Wilson, resigned.

—Mr. O. J. Travis has been appointed Superintendent of Bridges of the Illinois Central, with headquarters at Chicago, Ill., and will report to the Engineer of Bridges.

—Mr. J. A. Ridgely has been appointed Traveling Freight Agent of the Louisville & Nashville, with headquarters at Evansville, Ind., to succeed Mr. R. D. Sterne, resigned.

—Mr. F. S. Rollins has been elected Assistant Secretary and Assistant Treasurer of the St. Paul & Duluth, with headquarters at New York City, to succeed Mr. Pierre Jay, resigned.

—Mr. Judson Harmon has been appointed General Counsel for the Baltimore & Ohio Southwestern, with headquarters at Cincinnati, O., to succeed Mr. Edward Colston, resigned.

—Mr. Joseph J. Lanning, formerly Assistant to the General Manager of the Grand Trunk, at Montreal, who was retired about a year ago on account of ill health, died in Montreal on July 8.

—Mr. Theodore N. Ely, Chief of Motive Power of the Pennsylvania Railroad System, has received the honorary degree of Master of Arts, conferred by Yale University at the commencement last month.

—Yale University has just conferred on Mr. Samuel Harden Church, of the Pennsylvania Lines West of Pittsburgh, the honorary degree of Master of Arts, in recognition of the excellence of his "Life of Oliver Cromwell."

—Mr. W. H. Doll, Traveling Passenger Agent of the Southern, with headquarters at Chattanooga, Tenn., has been transferred to Nashville, Tenn., in a similar capacity. The office at Nashville is a new one.

—Mr. A. E. O'Brien has been appointed Traffic Manager of the Gulf, Beaumont & Kansas City, with headquarters at Beaumont, Tex., to succeed Mr. J. H. Phillips, resigned to take service with another company.

—Mr. James A. Wirthlin has been appointed General Freight and Passenger Agent of the Cincinnati, Portsmouth, Big Sandy & Pomeroy Packet Co., to succeed Mr. George P. Quiggin. Mr. Quiggin continues in his office as Secretary.

—Mr. J. Francis Le Baron, of Jacksonville, Fla., has been appointed Engineer for the Palatka Board of Trade for the improvement of the St. John's River and is now engaged in preparing plans and estimates for deepening the river at Orange Mills.

—Mr. Louis Williams Hall, who has been for over 30 years Solicitor and Counsel for the Pennsylvania, and was at one time a Director of the Northern Central, died suddenly from heart trouble at his home in Harrisburg, Pa., July 12, aged 64 years.

—Mr. Charles H. Markham, heretofore District Freight and Passenger Agent of the Southern Pacific, at Fresno, Cal., has been appointed General Freight and Passenger Agent of the company's line in Oregon, to succeed Mr. Charles F. Smur, promoted.

—Mr. George Van Ness Lothrop, ex-Minister to Russia, died at his residence in Detroit, Mich., on July 12, aged 80 years. Mr. Lothrop was General Council of the Michigan Central from 1854 to 1880. He became Minister to Russia by appointment of President Cleveland in 1885.

—Mr. T. C. Manion, heretofore Commercial Agent of the Central of Georgia, with headquarters at St. Louis, has been appointed Contracting Agent of the Louisville, Evansville & St. Louis, to succeed Mr. W. C. Price, resigned to accept service with the Blue Ridge Dispatch Line.

—Mr. F. Hufsmith, Master Mechanic of the International & Great Northern, at Palestine, Tex., has been appointed Superintendent of Motive Power and Rolling stock of that road, with headquarters at Palestine, and the office of Master Mechanic has been abolished.

—Mr. George W. Bartlett, heretofore Track Supervisor of the Southern Railway, with headquarters at Gainesville, Ga., has been appointed Roadmaster of the Columbia Division, with headquarters at Columbia, S. C. Mr. Bartlett was at one time General Superintendent of the Buffalo, Rochester & Pittsburgh.

—Mr. F. J. Easley, heretofore Superintendent of the San Luis Division of the Mexican Central, at San Luis Potosi, has been appointed Terminal Superintendent of the company at Tampico, Mex., to succeed Mr. R. M. Thomas, resigned on account of ill health. Mr. H. R. Cornforth has been appointed Acting Superintendent of the San Luis Division, to succeed Mr. Easley.

—The Massachusetts Executive Council has unanimously confirmed Hon. John E. Sanford for another term as Chairman of the State Railroad Commission. Mr. Boynton, the bicycle railroad man, presented his protest to the Committee on Nominations, but it seems to have had no effect. Mr. Sanford declined to appear before the committee of the Council in his own defense, evidently deeming Mr. Boynton's conduct too childish to be noticed.

—Mr. Alfred H. Smith, heretofore Superintendent of the Franklin Division of the Lake Shore & Michigan Southern, with headquarters at Youngstown, O., has been appointed Superintendent of the Michigan Division of the same road, with headquarters at Toledo, O., to succeed Mr. L. E. Johnson, resigned. It is expected that Mr. Smith will be succeeded on the Franklin Division by Mr. Philip Allen, now Superintendent of the Kalamazoo Division, with headquarters at Grand Rapids, Mich.

—Mr. M. F. Bonzano has been appointed General Agent for the Receiver of the Columbus, Sandusky & Hocking, with headquarters at Columbus, O., and will have charge of the traffic and operating departments of the road. Mr. Bonzano has been heretofore General Manager of the Chattanooga Southern, with headquarters at Chattanooga, Tenn., and will be succeeded in that position by Mr. W. S. Hoskins, heretofore Chief Clerk to the General Manager of the Atlantic system of the Southern Pacific. Mr. Hoskins will be succeeded by Mr. W. L. Lane.

—Mr. Charles Stewart, who died in Baltimore July 7 at the age of 93, was employed by the Baltimore & Ohio Railroad for more than 40 years, and, according to the *Baltimore Sun*, enjoys the distinction of having been driver on the first train, or rather the first car, run on that road, the occasion being the opening of the line on May 22, 1830, from Baltimore to Ellicott City, 15 miles. It was not a locomotive that Mr. Stewart drove, however, but a horse, steam engines having been introduced some time after.

—Dr. Hugh Pitcairn, of Harrisburgh, Pa., who has just been appointed United States Consul at Hamburg, Germany, was appointed Assistant General Superintendent of the Pennsylvania in 1865, and held that office for two years. He was subsequently appointed General Superintendent of the Evansville, Henderson & Nashville, continuing in that position until the sale of that road to the St. Louis & Southeastern, when he was appointed Superintendent of the Pittsburgh, Cincinnati, Chicago & St. Louis, at Pittsburgh, which position he resigned in 1875 on account of failing health.

—Mr. John E. Davidson, Third Vice-President of the Pennsylvania Co., operating the Pennsylvania Lines West of Pittsburgh, died July 11, at the Hotel Lincoln, in Pittsburgh, Pa., from the effects of an operation recently performed for appendicitis. Mr. Davidson was 59 years old and had been connected with the Pennsylvania for more than 30 years. He was appointed Treasurer of the Lines West of Pittsburgh in 1883 and held that position until 1891, when he was made Fourth Vice-President. He was appointed Third Vice-President in September, 1893, and had charge of the Accounting and Treasury Departments.

—Mr. Frederick Rogers, heretofore General Freight and Passenger Agent of the Washington & Columbia River Railroad, has been elected Assistant General Manager, and will combine in his new office the duties of his former position. Mr. Rogers began railroad service in 1876 with the Missouri, Kansas & Texas. He went to the Chicago, Burlington & Quincy in August, 1878. He held a number of positions with that company until 1886, when he was appointed Assistant General Freight Agent, holding that office until Jan. 1, 1891, when he was appointed General Freight and Passenger Agent of the Washington & Columbia River.

—Colonel James Andrews died last week at Pittsburgh Pa., at the age of 72 years. Colonel Andrews made a handsome fortune as a contractor, his greatest work having been building the piers of the Eads Bridge at St. Louis. He was also concerned in building the jetties at the mouth of the Mississippi River. Of late years he has been often before the public in connection with the project for a Tehantepec ship railroad and also for a canal from the Ohio River to Lake Erie. He was an enterprising and successful man, but without the training necessary to give him entirely reliable judgment on great engineering questions.

—Mr. Lucius E. Johnson, heretofore Superintendent of the Michigan Division of the Lake Shore & Michigan Southern, with headquarters at Toledo, O., has been appointed General Superintendent of the Norfolk & Western, with headquarters at Roanoke, Va. Previous to 1888 Mr. Johnson was Superintendent of the St. Louis Division of the Chicago, Burlington & Quincy. He was then appointed Superintendent of the Chicago Division of that company, serving in that capacity until 1890, when he was made Superintendent of the Montana Central. He was appointed to his late position on the Lake Shore & Michigan Southern in March, 1893.

—Mr. Alfred Walter was elected President of the Lehigh Valley Railroad July 13. Mr. Walter was born Oct. 2, 1851, at Brooklyn, N. Y. He began his railroad career as rodman in 1872 on the Allegheny Valley Railroad. He served then as Assistant Supervisor on the Pennsylvania, Supervisor on the Northern Central, Assistant Engineer on the Northern Central and the Baltimore & Potomac, in the motive power department of the Pennsylvania Railroad, as Division Superintendent on the Pennsylvania and on the Northern Central as General Superintendent of the Baltimore & Ohio Lines East of the Ohio River and for 2½ years as General Manager of the Erie. For nearly three years Mr. Walter has been in charge of the great coal properties of Cox & Co. He is a man of much force and vigor, physically and mentally, and carries to the difficult position which he has undertaken an uncommonly good equipment in many ways.

—Mr. John F. Wallace, Chief Engineer of the Illinois Central Railroad, has resigned that office to take a position as Vice-President and General Manager of the Mathieson Alkali Works, at Providence, R. I. This company has extensive works at Saltville, Va., and is building a new plant at Niagara Falls. It makes soda ash, caustic soda and allied products. While we must regret to lose Mr. Wallace from the circle of railroad engineers, we are bound to congratulate him on a change which is likely to make his life easier and to give him more comfort and money, if possibly less distinction, for Mr. Wallace had already become distinguished in the railroad service, and doubtless had greater honor before him. Mr. Wallace entered railroad service in 1869 in the civil engineering department. From 1871 to 1876 he was an employee of the Engineer Bureau of the War Department, and from 1886 to 1889 was in private engineer-

ing practice. Otherwise his entire active life has been spent in railroad work, generally as engineer, although he served as Superintendent on the Peoria & Farmington and on the Central Iowa. He has been Chief Engineer of the Illinois Central since March 1, 1892, and railroad men and engineers are very familiar with his record there. His work in elevating the terminal tracks at Chicago, in reorganizing the terminals there, in preparing for the World's Fair traffic, and in the terminal improvements at New Orleans, is all now well known, but not as well known as it deserves to be. Mr. Wallace is one of the vice-presidents of the American Society of Civil Engineers and served as President of the Western Society of Engineers for 1896.

ELECTIONS AND APPOINTMENTS.

Atlanta & Alabama.—The officers of this proposed road in Georgia and Alabama are as follows: President, R. M. Mitchell, Augusta, Ga.; Vice-President, W. H. Tisdale, Selma, Ala.; General Counsel, Gaston A. Robbins, Selma; Treasurer, W. A. Handley, Birmingham, Ala.; Secretary, L. E. O'Keeffe, Atlanta, Ga.

Boston, Quincy & Fall River.—Officers and Directors of this new company in Massachusetts have been elected as follows: President, A. H. Overman; Treasurer, J. F. Shaw; Vice-Presidents, Moody Boynton and O. O. Howard; Secretary, E. A. Perkins; Directors, A. H. Overman, R. L. Evans, J. F. Shaw, A. O. Perkins, F. W. Breed, E. Moody Boynton and E. A. Perkins. Subsequent to the election, Mr. Overman declined to serve as President.

Charleston & Western Carolina.—The office of W. A. C. Ewen, Vice-President, has been removed from New York City to Augusta, Ga.

Chicago, Indianapolis & Louisville.—The following appointments have recently been made: George K. Lowell, General Superintendent; L. H. Parker, Superintendent; F. Hall, Chief Engineer; H. Watkeys, Master Mechanic; W. P. Coburn, Assistant Master Mechanic; Charles Collier, Master Car Builder.

Cincinnati, Portsmouth & Virginia.—On account of his duties as General Freight Agent of this company and Traffic Manager of the Ohio & Charleston, E. F. Grav has been relieved of the passenger department, and T. D. Rhodes has been appointed General Passenger Agent in addition to his other duties.

Cleveland Belt & Terminal.—The office of Frederick Swift, Treasurer, has been removed from No. 47 Cedar street to No. 15 Wall street, New York City. O. E. Chapman has been appointed Assistant Treasurer. J. W. Wardwell, in addition to his office as General Superintendent, has been elected Secretary.

Columbus, Sandusky & Hocking.—M. F. Bonzano has been appointed General Agent for the Receiver, with headquarters at Columbus, O. He will represent the Receiver in his absence, and will have direct charge of the traffic and operating departments.

Fort Worth & Rio Grande.—R. H. Lord, Superintendent of Transportation, having resigned to accept other employment, the office has been abolished and its duties will hereafter be performed by C. H. Stevens, Chief Dispatcher, with office at Fort Worth, Tex. B. G. Plummer has been appointed Master Mechanic, with office at Fort Worth, to succeed H. D. Galbraith, resigned.

Franklin & Megantic.—George M. Vose has been appointed Superintendent, with headquarters at Kingfield, Me., to succeed F. S. Reid, resigned.

Galveston, Harrisburgh & San Antonio.—At the annual meeting of stockholders held at Austin, Tex., July 6, officers and directors were elected as follows: President, C. P. Huntington; First Vice-President, J. Kruttschnitt; Second Vice-President, W. G. Van Vleck; Secretary, C. B. Seger; Treasurer, Paul Flato; Assistant Secretary and Assistant Treasurer, Charles Babbidge. Directors, C. P. Huntington, J. Kruttschnitt, W. G. Van Vleck, C. B. Seger, J. T. Mahl, W. B. Mulvey and Charles Babbidge.

Gettysburg & Harrisburg.—O. S. Doolittle has been appointed Superintendent, with headquarters at Reading, Pa., to succeed A. M. Wilson, resigned.

Grand Trunk.—The following appointments have been made consequent upon the separation of the maintenance of way department from the engineering department. Eastern Division: J. M. Herbert, Trainmaster of the First, Second and Third Districts, with headquarters at Island Pond, Vt.; R. Armour, Resident Engineer, with headquarters at Montreal; S. J. Pegg, General Roadmaster, with headquarters at Montreal; A. Findley, Master of Bridges and Buildings, with headquarters at Montreal. Western Division: Edgar French, Resident Engineer, with headquarters at Detroit, Mich.; John H. Regan, General Roadmaster, with headquarters at Battle Creek, Mich.; S. McGee, Master of Bridges and Buildings, with headquarters at Battle Creek, Mich. Northern Division: W. B. Chapman, Resident Engineer; J. A. Cheer, General Roadmaster; G. A. Mitchell, Master of Bridges and Buildings, with headquarters at Allandale. Middle Division: Charles J. Crowley, Resident Engineer, with headquarters at Toronto, Ont.; Henry Ferguson, General Roadmaster, with headquarters at London, Ont.; William Crawford, Master of Bridges and Buildings, with headquarters at London, Ont.

Gulf, Beaumont & Kansas City.—A. E. O'Brien has been appointed Traffic Manager, with headquarters at Beaumont, Tex., to succeed J. H. Phillips, resigned.

Illinois Central.—O. J. Travis has been appointed Superintendent of Bridges, with headquarters at Chicago, Ill., and will report to the Engineer of Bridges.

International & Great Northern.—The title of F. Hufsmith, whose headquarters are at Palestine, Tex., has been changed from Master Mechanic to Superintendent of Motive Power and Rolling Stock.

Lake Shore & Michigan Southern.—The officers of the Freight Department now have jurisdiction as follows: James L. Clark, General Western Freight Agent, all through traffic at Chicago proper, with connections and all contracting and traveling freight agents in and west of Chicago; M. S. Chase, Assistant General Freight Agent, Chicago, local traffic between Chicago and Dune Park, inclusive; A. E. Billings, Division Freight Agent, Toledo, O., from Dune Park to and including Toledo and Rockwell Junction and the Detroit, Kalamazoo and Lansing divisions; George B. Wheeler, Division Freight Agent, Cleveland, O., east of Rockwell Junction to and including the Buffalo and Franklin divisions; H. J. Lawrence, General Agent, Pittsburgh, Pa., freight traffic from the Pittsburgh & Lake Erie south of Newcastle Junction.

Lehigh Valley.—At a meeting of the Board of Directors, held at Philadelphia, July 13, the resignation of Elisha P. Wilbur was accepted and Alfred Walter was elected in his stead. Edward T. Stotesbury, of Philadelphia; Charles H. Coster, of New York, and Mr. Wilbur, the retiring President, were made Directors in place of William L. Conyngham, Charles O. Skeer and George H. Myers, resigned. The Finance Committee was reorganized as follows: Alfred Walter, Edward T. Stotesbury, Charles H. Coster, E. P. Wilbur and Joseph Wharton.

Mexican Central.—R. M. Thomas, Terminal Superintendent at Tampico, having resigned, F. J. Easley, heretofore Superintendent of the San Luis Division, has been appointed to that office. H. R. Cornforth has been appointed Acting Superintendent of the San Luis Division, with headquarters at San Luis Potosi, to succeed Mr. Easley. The above appointments took effect June 30.

Norfolk & Western.—Lucius E. Johnson has been appointed General Superintendent, with headquarters at Roanoke, Va.

North Carolina.—The following Directors were appointed July 9 by Governor Russell: R. N. Norment, Virgil S. Lusk, H. U. Butters, John Graham, William Gilchrist, J. S. Armstrong, J. A. Smith and A. C. Avery. Mr. Avery succeeds Charles A. Cooke, who retires in order to become Attorney for the Board. J. A. Smith succeeds Judge Graham.

Old Dominion & Carolina.—The directors of this company, a notice of the incorporation of which was given in these columns last week, are Henry A. Boyd, Warrenton, N. C.; John T. Davis, Warren Plains, N. C.; D. H. Jackson, Petersburg, Va.; R. D. Davis, Petersburg, and Peter Arlund, Copenhagen, Denmark.

St. Paul & Duluth.—F. S. Rollins has been elected Assistant Secretary and Assistant Treasurer, with headquarters at New York City, to succeed Pierre Jay, resigned.

Santa Fe Pacific.—The following appointments have recently been announced: A. G. Wells, General Superintendent, Albuquerque, N. Mex.; E. Chambers, General Freight Agent, Los Angeles, Cal.; John J. Byrne, General Passenger Agent, Los Angeles; C. N. Sterry, Solicitor, Los Angeles; C. E. Cray, Auditor, Los Angeles; C. W. Kouns, Superintendent Car Service, Topeka, Kan.

Southern.—George W. Bartlett, heretofore Track Supervisor at Gainesville, Ga., has been appointed Roadmaster of the Columbia Division, with headquarters at Columbia, S. C.

Southern Pacific.—Charles H. Markham, heretofore District Freight and Passenger Agent at Fresno, Cal., has been appointed General Freight and Passenger Agent of the company's lines in Oregon, to succeed Charles F. Smurr, promoted.

Washington & Columbia River.—Frederick Rogers, heretofore General Freight and Passenger Agent, has been appointed Assistant General Manager. He will combine with his new office the duties of his former position.

Winchester & Strasburg.—At a meeting of stockholders, held at Baltimore July 7, the following Directors were elected: John W. Garrett, John W. Emmert, Albert Baker, James B. Russell and Andrew Bolling. John K. Cowen was re-elected President.

RAILROAD CONSTRUCTION, Incorporations, Surveys, Etc.

Atlanta & Alabama.—It is reported that nearly all of the money needed to build this road has been subscribed and that construction is to be begun soon. Preliminary surveys were finished last month and location will be begun at once. The road will run from Atlanta, Ga., in a general southwesterly direction through Fulton, Campbell, Coweta, Douglas and Heard counties, in Georgia, and through Chambers, Clay, Tallapoosa, Elmore, Autauga and Dallas counties in Alabama to Selma, in Dallas County. The route, which will be 180 miles long, is almost an air line. At a recent meeting of the stockholders the officers were elected whose name are given in another column.

Bangor & Aroostook.—An extension is proposed from the present northern terminus at Caribou northeast about 12 miles to Limestone. The new line, if built, will pass through a rich farming section of Aroostook County. It is reported that a separate company will be formed to build the new line, which will then be leased to this company.

Boston Elevated.—The President of the company, W. A. Gaston, with Charles A. Snow, as counsel, with others of the Board of Directors, had a conference with the State Railroad Commissioners on Tuesday last, at which the petition of the road for the right to issue \$15,000,000 of the \$20,000,000 of stock authorized by its charter was filed. A hearing will be given on the matter Wednesday, July 21. The purpose of the conference was to ascertain the position of the Commissioners on the matter of what the company should do before its application would be considered. The petitioners will have to satisfy the Commission that it has been regularly organized under its charter that it is in a position to make the \$500,000 forfeit deposit with the state treasurer required by law; that an issue of stock to the amount stated has been voted by the corporation; that it desires the money for construction, etc., and that it has obtained the locations upon which the road is to be built. On this point there is a hitch. The Board of Aldermen of Boston can grant the locations, but failing to do so the company can apply to the Railroad Commissioners. The same thing holds true of the approval of the style of construction. The petitioners, therefore, want the Commissioners to waive their usual rule, which is not a statutory condition, and not make the granting of locations by the aldermen a condition precedent to application for a stock issue. This point must therefore first be ruled upon in the coming hearing. No application to the city government for location has yet been made.

Boston, Quincy & Fall River.—This company has recently been incorporated in Massachusetts to build a "bicycle railroad" (one rail) from Boston to Fall River. At a meeting held at Boston, June 30, the officers and directors were elected, whose names are given in another column.

California Southern.—The Union Construction Co. has been incorporated under the laws of Arizona, with a capital stock of \$100,000, for the purpose of building this proposed line. The incorporators are: John W. Beckley, Albert Smith and A. A. Daugherty. The pro-

nosed line is to extend from Kramer, a point in San Bernardino County, Cal., on the Atlantic & Pacific, north 27 miles to Randsburg, a new gold mining camp, with a probable extension from Randsburg north about 75 miles to Ballarat, Inyo County.

Canadian Roads.—Sealed bids will be received for the construction of the Railway of the Valley east of the Richelieu River, and for furnishing construction material, up to July 30 at noon, at the office of P. H. Roy, 4 St. Lawrence street, Montreal. The road will be about 24 miles long, running from Iberville to St. Thomas, Missisquoi Co., P. Q. Specifications and conditions are to be seen at the office of Charles D. Maze, 32 St. John street, Montreal.

Chicago & Southwestern.—This company has recently been incorporated in Illinois with a capital stock of \$100,000. It is stated that the purpose is to build a road from Chicago in a general southwesterly direction to some point in Peoria County. The incorporators and First Board of Directors are: R. D. Rowe, B. Giroux, J. H. Brown, A. H. Miller and J. H. Middleton, all of Chicago. The principal office of the company will be at Chicago.

Cleveland & Pittsburgh.—The extension from New Philadelphia, O., into the Beaver Dam Valley has been completed and trains are now running. The road extends about six miles southwest, tapping a rich coal district. Its terminus is now only four miles from the Pittsburgh, Cincinnati, Chicago & St. Louis, at Uhrichsville.

Columbia & Western.—Plans are now being prepared for standard gaging this road, which now extends from Trail, B. C., in a general westerly direction to Rossland and Le Roi, 13.8 miles. The grade of the road, which is uniform four per cent, compensated, will remain the same. The extension from Trail northwest, 22 miles to Robson, has been graded and all bridges are built. The rails have been ordered and are now on the road from Chicago, and it is reported that standard gage equipment has also been ordered. It is expected that the line will be in operation between Le Roi and Robson by Sept. 1. Connection will probably be made at Robson with the Columbia & Kootenay for Nelson, and with the proposed Crow's Nest Pass line, to be built by the Canadian Pacific. On account of the failure to get a charter through the recent Parliament the proposed extension of this road from Robson to Penticton will probably not be built this year.

Geneva & Northwestern.—This company has recently been incorporated in Alabama to build a road from Geneva, Geneva County, in the southeastern part of the state, northwest through the counties of Geneva, Coffee, Covington and Butler, to a point in the latter county on the Louisville & Nashville, between the cities of Greenville and Evergreen. The capital stock of the company is \$60,000, most of which, it is stated, has already been subscribed. Among those interested in the new line are B. B. McKenzie, A. D. McLeod, J. W. Hitch, J. D. Harden, B. F. Hitch, W. G. McLaughlin, R. T. McDavid and D. G. Mallory.

Georgia Pine.—Work on this road, which is to extend from Bainbridge, Ga., north 30 miles, to Arlington, is being pushed rapidly, and it is expected that the road will be finished by November. About 10 miles from Bainbridge has already been graded. The capital stock of the company is \$160,000, and the road is being built with the proceeds of stockholders' subscriptions, no bonds to be issued. It is, however, proposed to issue \$60,000 or \$80,000 of preferred stock.

Inter Mountain.—J. L. Frankenberger has completed the preliminary survey for this line. It is to run from Boulder, Col., up Boulder Creek to the mouth of Four Mile Creek, which it will follow as far as Sunset, and finally reaches Ward, near the Utica mine. The distance is 26 miles. The gage is to be 30 in. The road will be used mainly for hauling ore and coal.

Kickapoo Valley & Northern.—McIntosh Bros., of Milwaukee, Wis., who have the contract for the extension of this road from its present northern terminus at Readstown, Vernon County, Wis., northeast 12½ miles, to Lafarge, have begun track-laying, and it is expected that the line will be built and train service begun by Sept. 1. A tunnel 600 ft. long will be necessary near Viola. The road now extends from Readstown, 38½ miles, to Wauzeka, Crawford County, Wis., where it connects with the Chicago, Milwaukee & St. Paul.

Jalapa Railroad & Power Co.—This company was recently incorporated in New Jersey, with a capital stock of \$250,000, for the purpose of building and operating a railroad in Mexico under a concession granted by the Mexican government to John B. Frisbie & Co. The incorporators are: Hosmer B. Parsons and Everett M. West, Brooklyn, N. Y., and J. Milton Ferry, Bayonne, N. J.

Lewisburg & Buffalo Valley.—Grading is being pushed on this road, which is to connect Lewisburg, Pa., with a tract of timber land recently purchased by Monroe H. Kulp & Co., in Lewis Township, 15 miles to the northeast, and it is expected that the line will be finished and in operation by Oct. 1. A bridge is now being built across Buffalo Creek. The construction work is light, there being no heavy grades. The company was incorporated in Pennsylvania last May with a capital stock of \$30,000. Monroe H. Kulp, Shamokin, Pa., is President.

Mexican Roads.—The concession given by the Mexican government to Alfred A. Spendlove and Enrique C. Creel (referred to in these columns May 7 last) provides that the plans for the first section of 200 km. (124 miles) must be submitted by the concessionaries to the Department of Communications within one year from April 13, 1897, and that subsequent plans shall be presented in sections of at least 25 km. (15½ miles). Within two years from the above date 200 km. must have been completed, and subsequent construction must proceed at the rate of 100 km. annually; the entire road must be completed within seven years from that date. A telegraph line shall be built for the exclusive service of the road. The company, with the consent of the Department of Communications, may build a terminal on the Pacific with piers, wharves and warehouses, plans for which must be submitted for the approval of the same department.

The concession held by Felipe Martel for a road from the Cazadero station of the Mexican Central to a point on the Mexican National, between Solis and Tepetongo, has been modified to provide that the concessionary must, within a year from June 19, 1897, and in each subsequent year, build at least 30 km. of the line in addition to the 30 already built. This provides for completing the entire line within four years from the date named.

Mexican Southeastern.—Plans have been prepared for an extension of 50 km. from San Jeronimo to a point near Niltpepec. It is reported that the country through which the line will pass is comparatively level

and there will be no difficult construction. There will be four bridges, with a total aggregate length of 500 ft. It is proposed to begin work as soon as the plans have been approved by the Department of Public Works, and it is expected that the line will be in operation in about four months.

Ontario & Rainy River.—It is proposed to begin construction on this new line in Ontario at once. The road has been subsidized (in two separate bills passed in 1894 and 1895) by the Canadian government at the rate of \$3,000 a mile for 80 miles. It is reported that rails for 15 miles of the line have been shipped to Port Arthur. The road will run from a point on the Port Arthur, Duluth & Western, northwest to Fort Frances, passing through the Mattawau iron fields and the Atikokan iron range.

Pennsylvania.—The company has resumed work on a number of improvements on its main line between Philadelphia and Pittsburgh, which is a gratifying evidence of the increase of business on the road. The third and fourth tracking will be carried out at Gordonville, at Leaman Place and at Kinzers. Work is going on on the new line west of Rheims. The line between Lilly and Portage, which is now double track, is being straightened; this work has been divided into four sections and awarded to the following firms: P. McManus, Charles A. Sims & Co., E. G. Gaynor and W. G. Stahl. The line between Conemaugh Furnace and Nineveh is being straightened, the contract being held by the Drake & Stratton Co., who built the new tunnel at Radebaugh.

Union Pacific & Sweetwater.—Surveys are now being made for this road, which is proposed from Hanna, Wyo., a station on the Union Pacific, northwest through Carbon County and across the North Platte River to Seminoe, thence north through Ferris to a terminus at Johnstown, north of the Sweetwater River, in Sec. 30, T. 30 N., R. 85 W. The company was incorporated in Wyoming last May with a capital stock of \$200,000. The incorporators are Ellsworth T. Martin, David G. Robertson and Oscar Coon. The trustees are Otto Gramm, James D. Negus and Ellsworth T. Martin. Otto Gramm, Laramie, Albany County, Wyo., is President, and James D. Negus, Cheyenne, is Chief Engineer. The company's principal office is at Cheyenne.

West Side Belt (Pittsburgh).—The officers of this road, which is designed to open up new coal lands in Western Pennsylvania, propose beginning construction this summer. The company was incorporated at Harrisburg, Pa., July 27, 1895, with a capital stock of \$200,000. The proposed road, for which surveys were made and right of way obtained last year, is to extend from a point on the Ohio River, along Little Sawmill Run and Big Sawmill Run to Curry Station and Findlayville, Pa., with a branch to the Duquesne Steel Works. It is proposed to acquire the Little Sawmill Run Railroad, which will be rebuilt and improved and used for a part of the line. The terminals at the Ohio River will be enlarged. It is expected that the section from West End to Curry Station, 12 miles, will be built first.

Electric Railroad Construction.

Braddock, Pa.—The Braddock & Homestead Street Railway has been put in operation. It is owned by the Mellon Brothers, bankers, and will be managed by J. C. Ross and will operate in conjunction with the Homestead & Highland line, the cars of each passing from Braddock to Oakland.

Charleston, S. C.—The Charleston City Railway Co., which is a reorganization of three of the companies operating a horse car line, has completed the electrical installation in a part of this line so that a few cars on one of its routes were put in operation this week.

Chicago.—The Englewood & Chicago Electric Street Railroad Co. began this week to operate five electric storage battery cars between Sixty-third street and Blue Island avenue. It is proposed to run the 20 cars as soon as the necessary machinery can be installed. It is reported that the two cars which have been run experimentally have operated for 40 per cent. of the receipts. If the entire length of this line is completed it will be over 50 miles, and will be the only electric road in this country operated exclusively by storage batteries.

On July 6 the Chicago General Electric Co. was granted a franchise permitting it to build an electric road over some 40 miles of streets in Chicago. The requirement to use the electric conduit system was stricken out, and privileges were granted to the company not contained in the original ordinance. The Mayor is expected to veto the ordinance, which has just passed the Council, but it is quite likely that it will be passed over his veto. The property owners some time since signed a petition favoring the new road, but with the understanding that no overhead wires would be used in its construction.

Cleveland.—The surveys for the Cleveland & Akron Suburban Railroad have been nearly completed. Work on the roadbed will be commenced within a month and it is hoped that the road will be in operation by the end of the year. The total length is 31 miles.

Cordoba, Mex.—It appears that more than one-half the grading on the Jalapa Cordoba Electric Railroad has been completed. The total distance between the terminals is over 50 miles, but it is uncertain when work will be begun on the Cordoba end of the line. Power to operate the road will be taken from the Tiole River. Three Pelton wheels developing about 1,200 H. P. will be installed.

Easton, Pa.—The Easton, Palmer & Bethlehem Electric Railway Co. has secured the right of way for an electric road from Easton to Bethlehem, and surveys will be made very soon.

Englewood, N. J.—The ordinance granting the electric road the right of way on Palisade avenue has passed its final reading, and is now in the hands of the Mayor for approval.

Framingham, Mass.—On July 7, the Framingham Union Street Railway Co., which has run horse cars on its line for the last 10 years, began using electricity as a motive power on its center division.

Lowell, Mass.—The Lowell & Suburban Street Railway, which now has 63 miles in operation, is building several new lines. One is an extension of its line from North Chelmsford to Tynsboro, 3½ miles, making it eight miles in all. Another is an extension from Wigginsville to Tewksbury Center, three miles. An engineer is laying out its Lakeville Park, which contains 113 acres, situated five miles from Lowell and nine from Nashua. The electric road between these cities runs through the park. An addition of 2,000 H. P. has been added to its plant this year.

Melrose, Mass.—The new belt line of the Lynn & Boston Railroad has been placed in operation. It is 3¼ miles long, starting from the Melrose depot, and running through Essex, Main and Porter streets to the east side district, and returning to the Wyoming depot and thence to the point of starting.

Middletown, Pa.—The Middletown Electric Railway Co. has asked permission to construct its tracks through the streets of Royalton. The Town Council is considering the matter.

Montoursville, Pa.—Work on the new electric line between this place and Williamsport will be commenced next week.

New Brunswick, N. J.—The Brunswick Traction Co. has accepted the ordinance granted by the Raritan Township Committee for an extension of its tracks in that township.

Pen Mar, Md.—Press reports from Hagerstown state that surveys are now being made for an electric road between Pen Mar and Waynesboro.

Pittsburgh, Pa.—The West End, Mt. Washington & Bankville Traction Co. has closed a contract with James McSpadden for the construction of its lines from Washburn avenue to Mt. Washington and Bankville, to be completed and in operation in three months. Work was begun July 6.

Reading, Pa.—A preliminary survey will be made within the next week or two from Collegeville westward to Saratoga and from Bramcote westward to a point to connect with the eastern terminus of an electric railroad at Reading. The ultimate object is to secure a continuous line from Philadelphia to Reading through the Schuylkill Valley.

Rockland, Me.—The Rockland, Thomaston & Camden Street Railroad is extending the Highland branch about half a mile to the head of Limerick street.

Salem, Mass.—The Lynn & Boston road is relaying its track on Lafayette street, Salem, and putting a new double track in Leach street to connect with the former line. It has recently equipped its line from Beverly to Asbury Grove with electricity. This road now operates 150 miles of track in 19 cities and towns in Eastern Massachusetts.

Versailles, Pa.—The Youghiogheny Valley Railroad Co. has presented ordinances asking for right of way over certain streets to Christie Park and Versailles. The company desires thus to complete its connection between West Newton and McKeesport.

Waynesboro, Pa.—A party of engineers is making a survey for an electric line from Blue Ridge Summit to Monterey, then to Buena Vista, then to Penmar and Blue Mountain House, High Rock, Mt. Quirauk and back again to the summit.

GENERAL RAILROAD NEWS.

Atlanta, Knoxville & Northern.—Judge C. D. Clark in the United States Court at Knoxville, Tenn., issued an order July 6 discharging Receivers J. B. Glover and E. C. Spalding, of the Marietta & North Georgia, of which this company is a reorganization. The road was sold under foreclosure on Nov. 25, 1895, and was bought in by the new company for \$950,000. The last payment of this purchase price has just been made, thus allowing the discharge of the Receivers.

Baltimore & Ohio.—Judge Goff, of the U. S. Circuit Court, at Baltimore, on July 10, authorized the receivers to issue \$680,000 of certificates to pay for 40,000 tons of new rails. Immediately after the disruption of the rail pool the receivers secured an option from the Carnegie Steel Co. of 50,000 tons of rails at \$17 a ton, and now propose taking 40,000 tons for use on the main line of the road. The application was opposed by J. P. Morgan & Co., the Mercantile Trust Co., of New York, and other large security holders. A new petition was filed by the receivers on July 10 asking for authority to buy 3,000 box cars and 750 hopper coal gondola cars, five 10-wheel passenger locomotives and 35 consolidation locomotives to cost in all \$2,345,050. Negotiations have lately been in progress between the receivers and car and locomotive builders, and terms for supplying this new equipment have been agreed upon. Appended to the petition is a report giving a comparative statement of the equipment at the beginning of the receivership and at the present time. There has been a continuous shortage of cars to fill orders, and without the use of foreign cars it would have been impossible to carry on traffic. For the use of these latter cars \$331,000 has been paid.

Chattanooga, Rome & Southern.—This company has recently been incorporated in Georgia as a result of the reorganization of the Chattanooga, Rome & Columbus. The capital stock of the new company is \$3,200,000, one-half of which is common stock and the other half non-cumulative, five per cent. preferred stock. The Chattanooga, Rome & Columbus was sold on July 13 last and was bought in for the bondholders by Simon Borg & Co. The incorporators of the new company are: Simon Borg, Leon Speyer, C. B. Welburn, Charles S. Pruden, W. M. Darby, Alexander Bonnyman and John C. Dell.

Cleveland, Cincinnati, Chicago & St. Louis.—The earnings for May and for the 11 months ended May 31 have been reported as follows:

May:	1897.	1896.	Inc. or Dec.
Gross earn.	\$1,067,288	\$1,051,579	I. \$15,709
Oper. expen.	821,751	810,036	I. 11,695
Net earn.	\$245,537	\$241,523	I. \$4,014
Charges.	216,474	243,782	I. 2,752
Deficit.	\$937	\$2,199	D. \$1,262
Eleven months:			
Gross earn.	\$11,999,188	\$12,533,552	D. \$534,064
Oper. expen.	8,984,316	9,371,015	D. 386,699
Net earn.	\$3,015,142	\$3,162,537	D. \$147,395
Charges.	2,634,303	2,602,318	I. 32,155
Surplus.	\$380,339	\$560,189	D. \$179,850

Chicago & Northwestern.—At a meeting of the Directors, held in New York City, July 9, the issue of a new consolidated mortgage for \$165,000,000, to retire all the existing issues of bonds was authorized. The new bonds are to be dated Nov. 1, 1897, and will run for 90 years, bearing 3½ per cent. interest. A special meeting of stockholders has been called for Sept. 22, in Chicago, when the new mortgage will be submitted by the Directors for action and for authorization of the new issue of bonds. The total bonded debt of the company as given in the annual report of May 31, 1895, was \$131,064,500. A

syndicate headed by Kuhn, Loeb & Co., has bought \$20,000,000 of the new bonds, which amount will be used mainly in taking up the following issues: Chicago & Milwaukee, first mortgage 7 per cent. bonds, payable July 1, 1898, amounting to \$1,700,000; Peninsula Railroad, first mortgage 7 per cent. bonds, payable Sept. 1, 1898, amounting to \$96,000; Iowa Midland, first mortgage 8 per cent. bonds, payable Oct. 1, 1900, amounting to \$1,350,000; Escanaba & Lake Superior, first mortgage 6 per cent. bonds, payable July 1, 1901, amounting to \$720,000; Chicago & Northwestern, Iowa Division, first mortgage 4½ per cent. bonds, payable April 1, 1902, amounting to \$1,411,000; Chicago & Northwestern, general consolidated 7 per cent. gold bonds, payable Dec. 1, 1902, amounting to \$12,336,000; a total of \$17,613,000.

Columbus, Lancaster & Wellston.—Judge Taft, in the United States Circuit Court at Cincinnati, has ordered a foreclosure sale of this road in September. He has appointed William F. Black, of Columbus, to succeed Col. W. H. Stevenson as receiver. B. R. Cowen, as Special Master Commissioner to examine the accounts of ex-Receiver Short, reports a shortage of over \$7,000. Ex-Receiver Short, however, has filed counter claims for over \$66,000. The hearing is fixed for Sept. 15. This road was chartered in 1887 under the name of the Lancaster & Hamden, to run from Lancaster, O., to Hamden and Wellston on the Baltimore & Ohio Southwestern. Afterward the route was changed, making Columbus the northern terminus. When eight miles of track had been completed, the road, in August, 1893, passed into the hands of a receiver under the present name of the Columbus, Lancaster & Wellston. The receiver was authorized to complete the road, and 34 miles, from Lancaster Junction to Bloomingville, are now in operation.

Cripple Creek District.—This company has given a mortgage for \$500,000 to the Central Trust Co., of New York, to secure payment upon certain gold bonds issued by the railroad company with interest at five per cent., payable semi-annually. The company was incorporated last April at Denver, Col., with a capital stock of \$1,750,000. Work has already been begun on the road, which is proposed to extend from Victor, Col., in a general northerly direction to Gillett, via Cripple Creek, with a branch to Gold Fields and Independence. L. M. Cuthbert, Victor, Col., is President of the company.

Delaware River & Lancaster.—This road, which has not been operated for several years, will be sold at auction at Westchester, Pa., on Aug. 24 by Master A. H. Wintersteen. The road is 12 miles long and extends from the Falls to French Creek Junction to a point near St. Peters, all in Chester County, Pa.

Denver, Leadville & Gunnison.—Receiver Trumbull last week filed with the United States District Court at Denver a statement of all extra work done upon the property since August, 1894. A summary of this shows expenditures in sidings, spurs, etc., \$12,313; surveying a proposed branch to Cripple Creek, \$4,301; construction of the Denver, South Park & Hill Top Railway from Fair Play to Hill Top mines, \$20,068, betterments other than already specified, \$33,224. The first item included the re-opening of the Alpine tunnel and the Gunnison branch.

Illinois Central.—The earnings for May and for the 11 months ended May 31 have been reported as follows:

May:	1897.	1896.	Inc. or Dec.
Gross earn.....	\$1,834,774	\$1,644,454	I. \$190,320
Oper. expen.....	1,308,544	1,294,003	I. 14,541
Net earn.....	\$526,230	\$350,451	I. \$175,779
Eleven months:			
Gross earn.....	\$20,396,653	\$20,312,727	I. \$83,926
Oper. expen.....	14,211,474	13,656,845	I. 554,629
Net earn.....	\$6,185,179	\$6,655,882	D. \$470,703

Intercolonial.—The Dominion government has given notice to the Canadian Pacific Railway that at the end of the fiscal year now current, the arrangement under which the C. P. R. uses the Intercolonial Railway between St. John and Halifax will be canceled. July, 1890, the government entered into an arrangement for the exchange of traffic over the government road east of St. John, N. B., from that point to the terminus at Halifax, N. S. The agreement was for seven years, either party to give notice one year in advance of the date of cancellation. This arrangement was detrimental to the interests of the government road. No Intercolonial agent was permitted to canvass for freight, and he could not advise a shipper to ship over the Intercolonial. The Intercolonial agents were also bound to absolute neutrality in regard to business between Halifax and St. John and in respect to all business for outside points originating between Halifax and St. John. The Department will probably make a new arrangement.

North Carolina.—Kerr Craig, the Special Master appointed by Judge Simonton, to take testimony and report to the Court on the question of alleged fraud and collusion in regard to the lease of this road to the Southern, has announced that he will begin the hearing of such testimony at Salisbury, N. C., July 27.

Norwich & Worcester.—The Railroad Commissioners of Massachusetts have authorized an issue of \$280,000 four per cent. 30-year bonds by this company, which will be used to pay the floating debt of the Norwich & New York Transportation Co., which it controls. In its application the company asked permission to issue \$300,000 bonds.

Ohio Valley.—This road was sold at Henderson, Ky., July 13, in consequence of a decree of foreclosure given in the United States Circuit Court for the Sixth District in the case of the Central Trust Co., of New York, against the road. The property was bought by Alexander P. Humphrey, of Louisville, Ky., and Adrian H. Joline, of New York City, attorneys for the Illinois Central. The amount paid was \$1,050,000, the upset price fixed by the Court. The road extends from Hopkinsville, Ky., to Evansville, Ind., 130 miles.

Southern Pacific.—On July 1 this company began operating the Sonora Railway and the New Mexico & Arizona Railroad under a temporary arrangement pending the completion of negotiations for acquiring the property. The last mentioned roads, which were formerly owned by the Atchison, Topeka & Santa Fe, are to be acquired by this company in exchange for the old Mojave Division of the Atlantic & Pacific, which has passed into the hands of the Atchison, Topeka & Santa Fe.

Summit Branch.—This road was sold at auction at Philadelphia July 13 for \$50,000. The property was bought in by Effingham B. Morris, President of the Girard Trust Co., for the bondholders. The sale was made to carry out the plan of reorganization recently drawn up by a committee consisting of Messrs. E. B. Morris, W. D. Winsor and George Wood. A brief de-

scription of the plan was given in these columns April 16.

Toledo & Milwaukee.—This company, which was incorporated in Michigan last month, is a reorganization of the Michigan Division of the Cincinnati, Jackson & Mackinaw, which extends from Allegan, Mich., southeast to Toledo, O., 156 miles, of which 133 miles, between Allegan and Dundee, Mich., is owned by the company. The road connects at Tecumseh, Mich., with the Detroit & Lima Northern and it is proposed to lease or sell the road to that company. The capital stock of the Toledo & Milwaukee is \$1,500,000.

Union Pacific.—The earnings for May, and for the five months ended May 31, have been reported as follows:

May:	1897.	1896.	Inc. or Dec.
Gross earn.....	\$1,455,139	\$1,257,978	I. \$197,161
Oper. expen.....	1,013,917	875,029	I. 138,888
Net earn.....	\$441,222	\$382,949	I. \$58,273
Five months:			
Gross earn.....	\$6,545,614	\$5,834,320	I. \$711,294
Oper. expen.....	4,394,235	4,030,944	I. 363,291
Net earn.....	\$2,151,409	\$1,803,376	I. \$348,033

Electric Railroad News.

Brooklyn.—The Appellate Division of the Supreme Court in Brooklyn has handed down a decision upholding the validity of the ordinance regulating the speed of electric cars adopted by the Aldermen, which fixed eight miles an hour as the limit. The Nassau Electric Railroad had been fined \$25 by a Police Justice for a single violation of the ordinance, but the judgment was reversed in the County Court. The Appellate Division now sustains the ruling of the Police Justice.

Dayton, O.—The Dayton News of July 2 states that the Home Avenue Railroad has been leased by the Chicago, Hamilton & Dayton Railroad, the conditions of the lease being that the steam railroad shall pay to the stockholders of the electric road a semi-annual dividend of not more than five nor less than three per cent. of the earnings of the road.

Dubuque, Ia.—On July 8 the Council passed the ordinance extending the charter of the Dubuque Street Railway Co. for 50 years from April next. This was the second reading of the ordinance, final action on which will probably be taken in a short time.

Enterprise, Miss.—Mr. John Kamper informs us that he has purchased the interest of W. E. Hall of Judge Buchanan, of Memphis, and Baldwin Buchanan in the Meriden Electric Railroad & Power Co. This gives him a controlling interest in the company.

Newburgh, N. Y.—A certificate has been filed with the Secretary of State of the consolidation of the Newburgh Electric Railway Co., Walden & Orange Lake Railroad Co., and the Newburgh & Orange Lake Railroad Co. into a single corporation, to be known as the Newburgh Electric Railway Co. The capital stock is \$150,000 and the Directors are Benjamin Norton, of New York; S. B. Dutcher, William H. Pouch, Alfred J. Pouch, Frederick H. Pouch, Alden S. Swan, William M. Tobias, S. Stewart Whitehouse, of Brooklyn, and C. N. Finch, of Summit, N. J.

Newton, Mass.—The Commonwealth Avenue Street Railway Co. is seeking an increase of stock and bonds for the purpose of meeting the expense of an extension of its line which runs through the new Newton Boulevard to Norumbega Park, at Riverside.

Olean, N. Y.—The State Railroad Commission has granted the application of the Olean Street Railway Co. for an increase of its capital stock from \$105,000 to \$300,000.

Philadelphia.—Press reports state that a syndicate of Philadelphia capitalists has completed arrangements for the purchase of the New York, White Plains & Elmsford Railway, the Citizens' Gas and Electric Co., of White Plains; the Port Chester Gas and Electric Co., and the Port Chester Street Railway Co., the entire transaction involving the transfer of something more than \$500,000 in stock. The Port Chester road has not been completed, the company having but very recently petitioned for a Receiver.

Racine, Wis.—Receiver H. J. Smith, of the Bell City Street Railway Co., has filed a petition to be allowed to sell the road at public auction, claiming that it would be for the best interests of the stockholders. The bonded indebtedness of the company is \$300,000 and the floating debt \$32,000.

Tonawanda, N. Y.—The attorneys for the New York Central & Hudson River Railroad have notified the Attorney-General that a motion will be made in the Special Term of the Supreme Court, on July 19, for the appointment of a receiver for the Tonawanda Street Railroad Co.

TRAFFIC.

Traffic Notes.

A lumber firm in Buffalo recently received a single shipment of 38 carloads of quartered oak from Memphis.

The New Orleans & Northeastern and the Mobile & Ohio have put on through Pullman sleeping cars between New Orleans and St. Louis.

A press dispatch from Lancaster, Pa., states that the National Transit Pipe Line Co. has begun to lay an oil pipe line from Millway, Pa. toward New York City, to be 130 miles long.

The transportation and hotel facilities of Yellowstone Park have been so completely engaged by the Christian Endeavor excursionists that it is announced that from July 17 to 25 no tickets must be sold for the Park.

The amount of freight carried through the two canals at Sault Ste. Marie in the month of June was 2,810,973 net tons, 2,255,957 being eastbound and 555,016 westbound. The number of passengers eastbound was 2,409 and westbound 2,221.

The Grand Trunk and the Canadian Pacific have announced reduced rates for bicycles carried in baggage cars. Where the ticket rate is under 10 cents, the charge for a bicycle is 5 cents; with tickets from 10 to 75 cents, the charge is 10 cents.

The excursion tickets for merchants coming to New York, which the Joint Traffic Association has agreed to sell at two-thirds regular rates on certain days this coming autumn, are to be so conditioned as to allow a stop-over at Baltimore and at Philadelphia.

New York City receives berries from the South by the carload for about three months. When the season in the South is past and the native crop has been used,

large quantities of fruit are brought from the north. For the week ending July 6 98 carloads of berries were received in New York City from Oswego, N. Y., and vicinity.

The Baltimore & Ohio has put on a second fast freight train to the West, to be known as Train 95. It will be made up at Baltimore, and is put on especially to accommodate import business by way of Locust Point. The train will make 50 hours to Chicago, 30 to Cincinnati, 30 to Cleveland, 78 to Kansas City, 74 to Milwaukee, 83 to Minneapolis and 44 to Toledo.

The opening of the "Lone Star Line" (Miami Steamship Company) between New York and Galveston has resulted in the complete demoralization of freight rates between these ports. The Mallory line first made a cut of 50 per cent., reducing the first-class rate from 80 to 40 cents, and since then other reduction have been made until rates as low as 25 cents or under on first class, with corresponding reductions on other classes have been made. The effect of these reductions has been to wipe out the Texas differentials, and the Texas rail lines have now joined in an agreement to charge full local rates from Houston and Galveston to all interior points in Texas on all business received from the steamship lines, pending a restoration of rates from New York and seaboard territory.

Disapproval of Reduced Rates for Ten-Car Lots of Grain.

The Interstate Commerce Commission, in an opinion by Commissioner Knapp, has announced its decision in the case of Paine Brothers & Co. against the Lehigh Valley Railroad and others. The carriers established rates on "ex-lake" grain from Buffalo to New York and Philadelphia and points taking New York and Philadelphia rates, which were lower on so-called cargo lots of 10,000 bu. of oats and 8,000 bu. of other grain than on shipments in carload lots, but afterward modified their tariffs, restricting cargo rates to export shipments, thus removing the principal grievance complained of.

It is held that the principle involved under lower rates for cargo or trainload quantities than for carload shipments, whether for export or domestic use, violates the rule of equality and tends to defeat its just and wholesome purpose, and such purpose is not fully accomplished by making all cargo shippers pay the same rate and charging all carload shippers alike. It is held that the defendants should reconsider their grain tariffs with a view to amendment thereof in accordance with the opinion of the Commission; and the case will be held open for such further action as may be deemed appropriate.

Chicago Traffic Matters.

CHICAGO, July 14, 1897.
It is given out that the Cleveland, Cincinnati, Chicago & St. Louis, in putting on a car ferry line between Manitowoc and Benton Harbor, will not ask for a differential, but will make the same rates as now prevail by the all rail lines. It is said that the ferry line will begin operations before Aug. 1, though it appears that only one boat will be put on the line at first.

The general managers have met and have "renewed their allegiance" to the pass agreement which was established at the beginning of 1897. It seems to be generally understood that since the dissolution of the old associations, after the Supreme Court decision, the agreement has had no effect whatever. The giving of passes to shippers was one of the first methods then taken to secretly cut rates, and now, it is said, every shipper of any consequence has all the passes he wants, and these "favors" are generally good until the end of the year. This being the case, the reaffirmation of the agreement would seem to be worth about 95 per cent. less than the paper on which the agreement is written.

The principal roads of Kansas and Nebraska have instructed their agents to load grain cars to their maximum capacity. This is one of the straws indicating that the traffic officers feel pretty sure of a large grain traffic the coming autumn.

The action of the Minneapolis & St. Louis in reducing lumber rates from Minneapolis to Illinois and Indiana points two cents per 100 lbs. has resulted, as was to be expected, in reductions by other lines and in other territory, until there is once more danger of a general demoralization in lumber rates. Efforts are being made to bring about a restoration of rates, and Chairman Midgley is hopeful that this will be accomplished.

The roads west of this city have agreed, after all, to give the wholesale merchants the cheap round trip fares for retail merchants that they have been asking for. A rate of a fare and one-third will be granted to Chicago and back on two days in August and two in September. The return tickets will be good for 10 or 15 days.

The revision of the western joint traffic agreement is again under consideration, an entirely new draft having been prepared and sent to the presidents of each road. It is proposed to call this the Western Traffic Association. As changes in this agreement are nowadays as plentiful as amendments to the tariff bill in Congress, and apparently of very little consequence so far as concerns actual business, it is hardly worth while to recount the details of the present proposition; but it may be noted that it provides for a fine of \$100 for violation and one of \$200 for failing to report divisions of all through rates, including those overroads outside the association.

Eastbound shipments from Chicago and Chicago junctions to points at and beyond the Western termini of the trunk lines for the week ending July 8 amounted to 57,760 tons as compared with 62,811 tons the preceding week.

This statement includes 15,829 tons of grain, 3,993 tons of flour and 13,359 tons of provisions, but not live stock. The following is the statement in detail for the two weeks:

Roads.	WEEK ENDING JULY 8.		WEEK ENDING JULY 1.	
	Tons.	p. c.	Tons.	p. c.
Baltimore & Ohio.....	3,043	5.3	3,782	6.0
C., C. & St. Louis.....	3,047	5.3	2,136	3.4
Erie.....	11,043	19.1	10,315	16.4
Grand Trunk.....	6,462	11.2	7,241	11.3
L. S. & M. S.....	3,117	5.4	4,233	6.8
Michigan Central.....	3,163	5.5	4,221	6.7
N. Y., Chi. & St. L.....	9,667	16.7	9,765	15.6
Pitts., Cin., Chi. & St. Louis.....	5,411	9.4	6,555	10.4
Pitts., Ft. Wayne & Chicago.....	9,322	16.1	10,656	17.0
Wabash.....	3,485	6.0	3,907	6.2
Totals.....	57,760	100.0	62,811	100.0

Lake shipments last week were 59,851 tons.